

Data for Paper

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Howard - A. Miller

Complete list of Birds recorded from Rancho La Brea Pleistocene.

as recorded
1939

- x Colymbus, sp.
- L x Podilymbus podiceps
Phalacrocorax — 10 only
- x Ardea herodias ^{in stubble field} 10 (Most Ciconia lesquatrei than Mycteria) 111
- ✓ x Casmerodius albus 12 - 40
- ✓ x Egretta thula?
- ⊙ x Florida caerulea?
- ✓ x Butorides virescens sylvan
- ⊙ x Nycticorax nycticorax 1 sylvan
- x Botaurus lentiginosus — 10
- ✓ x Ajaja ajaja?
- ✓ x Ciconia maltha ~~Mycteria wetmorei~~ absent (dry prairie or fields) (this Ardea lesquatrei than Mycteria)
- ✓ x Mycteria wetmorei absent
- x Mycteria americana?
- x Plegadis guarauna 1 67
- ✓ x Cygnus columbianus never far from deep water
- x Branta canadensis — 210
- ✓ x Branta minuscule absent
- x Branta nigricans?
- x Anser albifrons
- ✓ x Chen hyperborea
- ✓ x Chen rossi?
- x x Anas platyrhynchos adaptable (even ephemeral ponds, temporary flooded fields) 10 only?
- x Chaulelasmus streperus
- x x Nettion carolinense } — 10 -
- ✓ x Querguedula, sp.
- ✓ x Nyroca californiana?
- ✓ x Nyrocinae, two species
- x Cathartes aura — 10 rare in timber or brush
- ✓ x Coragyps occidentalis — 10 typical arid sylvan, Ariz. central desert
- x Gymnogyps californianus — 10 - rare in timber or brush
- x Vultur clarki absent (Vultur today on dense forest)
- ✓ x Cathartornis gracilis absent
- ✓ x Teratornis merriami — 10 rare in timber?

004/19.00

✓ - X Neogyps errans - 10

✓ - X Neophrontops americanus - 10 -

X Elanus leucurus - 10 -

Common - X Astur atricapillus

sylvan

X Accipiter velox - 10 -

X Accipiter cooperi - 10 -

X Buteo borealis - 10 +

X Buteo swainsoni - 10 +

✓ X Buteo lagopus - 10

✓ X Buteo regalis - 10

X Buteo, sp.

✓ - X Urubitinga fragilis - 10 -

✓ - X Wetmoregyps daggetti

✓ - X Morphnus woodwardi - 10 -

X Aquila chrysaetos - 10 +

✓ - X Spizaetus grinnelli - 10

X Haliaeetus leucocephalus - 10

X Circus hudsonius - 10 +

✓ X Polyborus cheriway - 10

X Falco mexicanus - 10 +

X Falco peregrinus - 10 +

X Falco columbarius - 10

X Falco sparverius - 10 +

X Lophortyx californica ? - 10 -

✓ - X Parapavo californicus - 10 +

X Grus americana?

X Grus canadensis - 10 -

✓ X Fulica americana

sylvan in breeding
limit over open country sometimes

plains to forest desert to marsh
mostly open country?

open country

10

10

10

10 -

absent sylvan?

10 -

10 +

10

10

10 +

10

10 +

10 +

10

10 +

10 -

10 +

10 -

10

10

10

10

10

- ✓ x Squatarola squatarola - 10³ -
 ✓ x Oxyechus vociferus - 10
 ✓ x Numenius americanus - 10 -
 ✓ x Phaepus hudsonicus - 10 -
 ✓ x Totanus melanoleucus - 10 -
 ✓ x Limnodromus griseus
 ✓ x Recurvirostra americana
 ✓ x Larus brachyrhynchus? - 10 only
 ✓ x Rissa tridactyla? - flock sylvan
 x Columba fasciata - 10 - planis dweller
 x Zenaidura macroura
 x Geococcyx californianus - open + desert
 x Tyto alba ~~albatross~~ - 10 + open territory
 x Otus asio - sylvan
 x Bubo virginianus - 10 + adaptable
 x Glaucidium gnoma - forest core (pine chipmunks)
 ✓ x Cryptoglaux acadica
 x Speotyto cunicularia - 10 + open territory
 ✓ (2) x Strix brea - absent
 x Asio wilsonianus - 10 + sylvan
 x Asio flammeus
 x Colaptes cafer
 ✓ x Ceophloeus pileatus
 Alder x Syndesmus lewisi
 Tyrannus, sp.
 Otocoris alpestris
 Pica nuttalli
 Aphelocoma, sp.
 Corvus corax
 Corvus brachyrhynchos
 Corvus caurinus
 Penthestes, sp. Toxostoma, cf. redivivum Sialia, sp.
 Bombycilla cedrorum
 Lanius ludovicianus
 Sturnella neglecta
 Xanthocephalus? Agelaius, sp. Icterus, sp.
 Euphagus magnirostris Indeterminate fringillids

(84) Total

224/1460

leave out and chimney of humul
from left hand column. It
probably was more like first
humul in nature in upper
part (leaves etc.) although
not specific. Bones
stop soon second
2) chimney. So a distinction
in local occurrence
between here &
vicinity of Homer.

Lophortyx californica		1	
X */2 Parapavo californicus	churn 2	10	
*/1 Grus canadensis	" 1	5	
Squatarola squatarola		1	
Oxyechus vociferus		1	
*/1 Numenius americanus	churn 1	1	
*/1 Phaeopus hudsonicus	" 1	1	
*// Catoptrophorus inornatus		1	
Larus sp.		1	
Zenaidura macroura		1	
*/ 4 ⁷ Tyto alba	sump 1 churn 7	100 99	92 + 8 = 100
*/1 Bubo virginianus	churn 1	4 6	
*/6 Speotyto cunicularia	sump 1 churn 5	104	
*/7 Asio	churn 7	57	OK
*/7 Corvus corax	sump 1 churn 6	32 26	— X
*/2 Corvus hesperis	sump 1 churn 1	12	— X
Corvus caurinus		1	
*/⁸7 Sturnella neglecta	sump 2 churn 7	72 ⁴	OK
Pica nuttallii		1	

based on
tissue, because
a larger
representation
than for
humans

Same for churning 1 + sump or
for both churning + sump

405

311
406
717
718

92

Photo numbers

✓46 Human femur, bird & fox bones Feb. 13, 1914

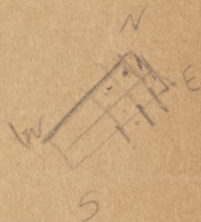
47 " " " " " " " " looking N.E. (Kearney)

✓48 " " " " " " " " " " (Kearney)

✓49 Horiz. line indicates level of earth at S.W. base of asphaltum intercept
10 ft to left of line 10, Tag 10 = datum. Feb. 16, 1914

✓50 asphaltum pipe, looking N.E. from surface Feb. 16, 1914

(with board beside it) 2 ft (?) mark below ^{Horiz.} crack



66 Coracoid of *Tenatomis* in F 11, 3'-4'

✓68 Horn & *Tenatomis* bones in F 11, 4'-5' $\frac{1}{2}$

✓71 Tar reservoir underlying E & F 6, 7 and 8

✓32 Human cranium & femur, looking N.E. at angle 65°

33 " " " " " " " " " " " "

34 " femur (beside rule), from N.W. wall at angle of about 85°
cross marks cavity where cranium lay, Feb. 9, 1914

✓35 " skull, femur & portion of pelvis looking S.W. at angle of 25°

✓36 "Pipe" or "dyke" where human bones were found. Feb. 6, 1914

✓81 Projecting corner of N.E. & S.E. walls G-10 March 25, 1914

✓82 N.W. wall in F 10 & 11

① Initial cut - 2'-7' K3530-36
Buteo swainsoni, sternum
Buteo borealis, tarsus
Cathartes aura, coracoid
Aquila chrysaetos, femur
Corvus corax, tarsus, femur
Sturnella neglecta - tibia

② F11, 2½-4' K3537-79 ^{North or 2nd chance}
Buteo regalis, femur, cora, hum. sternum, tarsus (5)
Teratomis merriami, ulna (1)
Cathartes aura, sternum (1)
Tyto matricola, femur (1)
Osis?, sternum, 3 hum., 3 fem., 3 tibiae, 2 tarsi, 2 ulnae, sternum (5)
Parapavo californicus, tibia (1)
Aquila chrysaetos 6 bones (indiv?) (6)
Neophelopsis, ulna (1)
Neoglyphis, cranium (1)
Corvus corax, tibia (1)

③ F11, 4-5½' K3580-95' ^{North or 2nd chance}
Teratomis merriami, cora. (1)
Osis, ulna (2)
Umbitanga fragilis, coracoid (1)
Aquila chrysaetos, 2 carpus, hum. - (2)
Polyborus pectoratus, carpus (1)
Amur albifrons? ulna (1)

④ E1F, 8F9, 9-13½' K3596-3644 (Samp)
Buteo swainsoni, 2 tarsi (2)
Cathartes aura, scapula (1)
Tyto matricola, 1 tarsus (1)
Speotyto cunicularia, tarsus (1)
Sturnella neglecta 2 tibiae, 3 hum. (2 indiv) (2)
Corvus corax, 1 tarsus, 2 carpus, 1 femur, 1 tibia (2)
Corvus hesperis, tarsus (1)

⑤ F10, 8¼-9' Feb. 16, 1914, K3645-3723

Coragyps occidentalis, femur (1)
Tyto matricola, tarsus (1)
Parapavo californicus, 2 tarsi (indiv.) (2)
Aquila chrysaetos, 1st, 1 left tarsus (2)
Circus hudsonius, tarsus (1)

⑥ Horn deposit, under 8 ft, K 3724-4327

Buteo swainsoni, 4st, 1 left tarsus (5)
Buteo regalis, 3 left tarsi, 1st (3)
Buteo borealis, 4st, 1 left tarsus (5)
Teratomis merriami, 2 tarsi, 2 ulnae (4)
Coragyps occidentalis, 1 tarsus, 3 femora (2 indiv.) (5)
Cathartes aura, 1 tarsus, 2 cora, 1 hum. (2)
Falco mexicanus 2st, tibiae, hum., tarsus, 1 left tibia (2)
Falco peregrinus 2 left tarsi, 1st, 1 left rib (4)
Falco sparverius, ulna (1)
Tyto matricola 3st, 7 left tarsi (10)
Osis, 7st, 1 left tarsus (8)
Speotyto cunicularia 2st, 5 left (7)
Parapavo californicus 2st tarsi (2)
Umbitanga fragilis, tarsus, humerus (2)
Aquila chrysaetos - 9 left, 7st tarsi (16)
Neophelopsis americana, tarsus, 2 left tibiae (3)
Phalacrocorax humerus (1)
Circus hudsonius 5st, 6 left tarsus (1)
Polyborus pectoratus, humerus (1)
Opus canadensis 1st, 1 left tarsus (2)
Thimopsis americana, carpus (1)
Phaethon hudsonius, humerus (1)
Spatula clypeata, tarsus (1)
Neoglyphis, sternum, femur, humerus (3)
Morphnus woodwardi, coracoid (1)
Bubo virginianus humerus (1)
Cataphictes inornatus humerus (1)
Corvus corax many (6 indiv) (6)
Sturnella neglecta (7 indiv) many bones (4)
Corvus brachyrhynchos (1)

at an age greater than it is. Nor, on the
other hand, do we feel believe the opposite effect
could be produced, for as Miller has in-
dicated, if the outer matrix the bones from
these outer matrix are

Boxes of P & 10

mammals

- # 5 - ✓ Dried Fial cut 2-7 ft. Rogers & Feb. 7, 1914
6 - ✓ E & F - 8/9 to 13 1/2 - mar. 1914
2 - Bear, 80 ft. (from uncollected) 3-13 ft. Feb. - mar. 1914
Birds
X # 18 - same as # 5 for mammals
X # 23 - from dump mar. 1914
1/2 # 25 - F 11, 2 1/2 - 5 1/2 Homo dep.
✓ ? 8 ft

K 3530-4300 series

Humerus

under	K 3813	- Sturnella	rt
ETFF819	K 3623	- Sturnella	rt
under	K 3990	"	rt
"	K 3988	"	rt
"	K 4152	"	rt
ETFF819	K 3622	"	rt
under	K 3887	"	rt
ETFF819	K 3624	"	left
under	K 3994	Sturnella	rt
"	K 4149	Sturnella	rt
"	K 3982	- C. corax	all same side left
"	K 3984	- C. corax	
"	K 3985	- C. corax	

Tarsus

ETFF819	K 3617	C. brachy (hesperis)
✓	K 3977	C. brachy (")
✓	K 4160	} indeterminate
✓	K 3838	

ETFF819	K 3880	"
	K 3616	"
✓	K 3797	Corvus corax left
✓	K 3981	" left
ETFF819	K 3618	" left
✓	K 3792	" rt
✓	K 3978	" rt
✓ initial out	K 3532	" rt
✓	K 3794	" left
✓	K 3979	" rt
✓	K 3799	" rt
✓	K 3980	" at
✓	K 3793	" rt

3530-39 initial out 2-7 ft
 3540-3590 F11 2 1/4 ft Mar 12 1914
 3596-ETFF819-9-13 1/2 ft March 1914
 3645-3723 F10 8 1/2 -9' Feb 16, 1914

Carpometacarpus 3724-4300
 14 under 8 ft

K 3815	C corax left
K 3820	C corax left
K 3976	C corax rt
ETFF819 K 3615	C corax rt
K 3973	C corax left
K 3975	C corax left
K 3821	C corax left
K 3974	C. corax rt
ETFF819 K 3614	C. corax rt
K 3972	C. corax rt

Tibiotarsus

K 3992	Sturnella left
K 4154	- Sturnella rt
K 3989	- fragment
K 3836	- Sturnella left
K 3986	- C. corax
✓ K 3547	- C. corax F11
K 3825	- C. corax
K 3983	- worn Corvus corax?
K 3826	- C. corax
K 4151	- Sturnella left
K 3535	- Sturnella rt initial out
K 4156	Sturnella rt
K 3993	Sturnella left
K 3835	Sturnella rt
K 3991	Sturnella rt
K 4155	Sturnella left
K 3628	Sturnella rt ETFF819
K 3987	- fragment C. corax?
K 4298	- ? fragment Sturnella?
K 4157	- Sturnella left
K 3905	- fragment
K 3873	Sturnella left
K 4159	fragment
K 4158	fragment
K 3868	fragment
K 4153	fragment

Humer

K 3638 C. corax EFP, YP9
K 3860 ?
K 3533 C. corax ~~initial~~ cut

Ulna K 3851 C. corax

K 3885 indet

K 3620 C corax

K 3886 - ?

K 4142 - Falco sparverius right

K 3621 - ?

K 4113 (listed as K 414(?) 3 ?)
C corax

Mandible

K 4302 Spizella rthalf

Scapula

K 4150 indet

Coracoid

K 4093 indet

K 3889 humerus fragment (rt) probably Sturnella

K 3837 tibia fragment ?

K 3610 femur fragment ?

~~Hum 3889 not sent a humerus~~

~~3905~~

~~3838~~

~~3977~~ Fa #2

2985 hum

4150 "

① K3530 - 34 ———— Pt 10#3, initial cut
2-7 ft, 2/7/14

② K3537 - 79 ———— Pt 10, F-11, 2½-4 ft (5/12/14)

③ K3580 - 95 ———— Pt 10, F-11, 4-5½ ft. (3/12/14)

④ K3594 - 3644 ———— Pt 10, #6, E & F8, 9-13½ ft + 1/11/14

Pt 10, F-10, 8¼-9 ft, 2/16/14

⑤ K3645 - 3723

Pt 10, Homödep. under 8 ft

⑥ K3724 - 4327

(1)

Feb 10

6273

- ✓ VF 1835 Terry humerus (~~Terry's mandible~~) bones not combed, fibula phal. or carapace etc
- VF 2227-51 scapula IIII
- VF 2268-70 " III
- VF 2280-86 " 2286 Missing IIII
- VF 2297-2316 - " IIII
- VF 2335-2342 " IIII
- VF 2353 " I
- F 2443-49 "
- F 2463 "
- VF 2469-73 " (69-70 cataphacts), 2471, 23 ✓ Missing 2469-70
- VF 2484-86 " III
- VF 2504-11 " 2506-11 ✓, 2507-5 IIII
- F 2525-26 "
- VF 2570-84 " IIII
- VF 2589-99 " Missing 2596 ✓ IIII
- VF 2608-18 " 2608-11-12-16 IIII
- VF 2663-70 mandibles 2667, 2663-65, 68-70 ✓ IIII
- F 2683-93 "
- VF 2701-03 " IIII
- VF 2739-41 " IIII
- VF 2744-45? " I
- VF 2809-29 " 2809-14 ✓, 2819-29, 16-18 IIII
- VF 2855-68 " 2855-58 ✓, 59-68 ✓ IIII
- VF 2942 " Duck or goat I

- ✓ F 2951-52 - mandibles
 ✓ F 2954
 ✓ F 2959-60
 ✓ F 2972-75 " ~~2475 Missing~~ 4
 ✓ F 2977-80 " IIII
 F 3001-02 " III IIII
 ✓ F 3022-34 " (F3024 Tyto?, 3022-23, 27, 3025-26, 28, 29-34
 ✓ F 3036-49 " 3038-41, 43-45, 3036-37, 3046-49 Missing 3042
 ✓ F 3058-60 " 3058 Beak Hawk 3059-60 Beak Hawk
 ✓ F 3100 " Beak Hawk
 ✓ F 3128-31 " (F3131 Gyrfalcon? Beak) 3130 Eagle Beak 28, 29 Beak
 ✓ F 3144-45 " Falcon Missing 3173
 ✓ F 3173-76 " 3174-76 Beak Hawk
 ✓ F 3179-96 " (3179-80 Cath beak), 3192-93 Cran. 94-96 Cran. 81-91 Cran
 F 3234-36
 F 3243
 ✓ F 3250-53 " (53 Cath. cranium) 3251, 50, 52
 ✓ F 3255-57 " 3255-56 Cran 57
 ✓ F 3297 " cranium
 ✓ F 3327-29 " 3328 Quadrate, 29 part of skull, 27
 ✓ F 3497 " bottle only
 ✓ F 3499 " quadrates
 ✓ F 3504-05 " bottle of 3604, 05 (several)
 ✓ F 3515 " (19-21 = pelvises) 3578 bottle only
 F 3517-21
 F 3525-26 pelvises
 F 3532-38
 ✓ F 3545-46 " 3546 Missing 3645
 ✓ F 3568-71 " Missing 3621
 ✓ F 3604-31 " 3622-34, 18-20, 3604-16
 ✓ F 3646-51 " 51-46-50
 ✓ F 3658-59
 ✓ F 3664-69 " 3664-68-69

✓ F 5526-75 *femur* (Circus?) Pithco cont'd 4
 ✓ F 5576-80 " (5577-78 Hawk?) Missing 5576 and 5580
 ✓ F 5582-83 " (Circus?) Geocoryx
 ✓ F 5586-95 (95 *passerina*) 5586, 89-92, 5587-88, 93-94 39
 XF 5601-39 *femur* (passerina)
 ✓ F 5655-61 " (5655 = ") 5660 *Circus?* 5661 *Ac. velox?* 5669, 5670 (ano?) 5671, 5666
 ✓ F 5666 " Missing 5668
 ✓ F 5682 " (Circus?)
 XF 5885-5914 " (passerina)
 ✓ F 6054-6115 " 6115
 XF 6117 " (passerina)
 ✓ F 6161-6221 *tibia* 6174-91, 6173-99, 6200-17, 6219-21, 6161-64, 68-72 Missing 6165, 6173, 6192, 6218
 ✓ F 6401-6542 " (6401-6542, 6505-93, 65-42, 6485, 6470) Missing 6406, 38, 42, 45, 6449, 58, 60, 63, 64-70, 75, 97-100, 6460-81, 84-88, 90-92, 93, 97, 99, 6504-42, 6485, 87, 88
 ✓ F 6759 " (Condor?)
 ✓ F 6764 " (stork?)
 ✓ F 6774-92 "
 ✓ F 6891-6922 " Missing 6892
 ✓ F 6989-92 " (Parapavo)
 ✓ F 7039 " Eagle (Cypripis)
 ✓ F 7082-7129 "
 ✓ F 7194-7214 " (Buteo?)
 ✓ F 7218-7247 " (7218-21 Buteo? 7222-66 Circus?) Missing 7267
 ✓ F 7273-7403 " (B. swainsoni?)
 ✓ F 7307-7332 " (7307-10, 12-13, 15-16, 19-21, 23-25, 26-32)
 F 7354-56? (magn?)
 ✓ F 7373-75 "
 ✓ F 7399-7407 " (7402-07 = same) 7399-01 Parapavo? 7405 7402-4, 06-07
 ✓ F 7409 "
 ✓ F 7415 " (water bird?)
 ✓ F 7436-39 " (Bubo)
 ✓ F 7503-18 " Missing 7537, 7543, 7544

655

- ✓ R 3696-97 *pelues* II
 ✓ F 3708-28 " 3708-09, 10-28 ✓ III III III III I
 ✓ F 4052-53 " II
 ✓ F 4062-76 " 4263, 64-76 III III III 377
 ✓ F 4087 " I
 ✓ R 4100-4111 " 4111 ✓ 00-10 III III II
 ✓ F 4179 " I
 F 4205 " IIII
 ✓ F 4225-28 " II
 F 4238 " II
 ✓ F 4249-50 " 4250 ✓ 49 I
 F 4252 " (gassins) III III III
 ✓ F 4374-4400 *genu (eagle?)* Missing F 4378, 81 III III III
 ✓ F 4636-37 " (rapture?) 4636 *mystica?* Missing F 4637 III
 ✓ F 4651-53 " (owls?) III
 ✓ F 4661-4715 " *typo?* ~~4661, 4662, 4663, 4664~~ III III III III III III III III III III III
 ✓ F 4824 " *Polyboms* III III III III I
 ✓ F 4845-65 " (typo?) 04 missing III III III III III
 ✓ F 4888-5012 " (5003-5012 *Cathartes*) (4974-5002 *Buteo?*) 4888-4911, 4913-73 ✓ III III III III III III III III III III III
 ✓ F 5018-49 " 5018-36, 37-39, 40, 45-49 (and?) III III III III III III III III III III III
 ✓ F 5086-5154 " (5086-5109, 5136-54 ✓, 5108-19, 1621, 23-26, 27-29, 31-35 ✓ III III III III III III III III III III III
 V-F 5217-25 *Jenny* (5224 missing) (*Buteo*?) III III
 V-F 5306-07 *Jenny* (*Goose*) I
 ✓ F 5312 " (*Coragyps*) III III
 ✓ F 5319-25 *Jenny* (*Buteo*?) III III III III III III III III III III III
 ✓ F 5354-5402 " Missing 5385 III III III III III III III III III III III
 ✓ F 5450-5476 *Jenny* (*Buteo*?) III III III III III III III III III III III
 ✓ F 5492-94 " (5493-94 *Hawks?*) Missing 5492 *kite?* III

~~7897~~-98, 7929, ~~872~~ 56

✓ F 8967-68 *Hummer* (hawk?) 8968 ✓ 67 ✓
 ✓ F 8984-89 " (Raven) 16
 ✓ F 9003-21 " ("")
 ✓ F 9054-81 " (Hawk?) 9054-56, 58-64, 66-80, 81 ✓ 6 (Missing owl 65) 28
 ✓ F 9100-9105 " (passerine) 2
 ✓ F 9128-29 " ("") 4
 ✓ F 9133-34 " (hawk) 16
 ✓ F 9140-55 " (falcon) (9154, 6000?) 15
 ✓ F 9166-80 " (80 = Crow) 18
 ✓ F 9192-9209 " (falcon) 9201-09, 9192-9200 Bubs? 4
 ✓ F 9200-9203 " ("Great horned or spotted owl?") 93 ✓
 ✓ F 9809-9914 " (9809-9909 = passerine, 9910-14 Bodys says passerine) 106
 ✓ G 42-45 " (falcon) 4
 ✓ G 124-216 " (passerine, except 6211-12 V.A. sparrow) 1
 ✓ G 512 " (dove) 2
 ✓ G 572-73 " (Waterbirds) 572, 573 - Oxyechus? 1
 ✓ G 640 " (Cerulean?) 62
 ✓ G 649-711 " (Barn owl) Missing 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000 68
 ✓ G 758-832 " ("") 29 39
 ✓ G 922-958 " (Asio?) (923-24 Kite?) 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000 68
 ✓ G 973-76 " (Asio?) 4
 ✓ G 982-1149 " (Barn owl?) 168
 G 1150 " (Spizaeetus) 1
 ✓ G 1151-1206 " (Barn owl?) 56
 ✓ G 1502-1510 " (Eagle?) (G1509-10) Missing 1506 10
 G 1523 " (Ceryle?)
 ✓ G 1524-34 " (Terry?)
 ✓ G 1661-62 " (Agelaius)

37
 93
 218
 348
 11
 704

Missing 9910

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 1
 62

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 168
 1
 56
 244
 348
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11111
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PT 10 cont'd 7

59

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86

7.2

159

254

749

✓G 1717-20 humerus (eagle)

4

✓G 1835-36 " (Parapavov)

2

✓G 1839-40 " (Cathartes)

1

✓G 1841 " (Goose)

4

✓G 1842-45 " (Cathartes) (G1844 eagle?) = look up

✓G 1846-91 " (Miray, 1852-63, 65, 70, 78, 90-91, 187, 76, 92-93, 97, 1851, 1849 Phalaropus?, 1850-)

✓G 1988-94 " (Cathartes except which is too fog & hose of sp.)

✓G 2248-339 " (Miray 2257, 2490, 78-82, 92, 94, 2306, 2338, 2341-59 = Hawk?) (2248-339) (2306, 2338, 2341-59)

✓G 2451-52 tarsus (Terry?)

1

✓G 2465 " (Gymnos?)

1

✓G 2488 " (Cathartes)

12

✓G 2495-2506 "

✓G 2536-37 " (Neph?)

✓G 2629-2696 " (Agrius except 2648 = spiz.)

✓G 2744-64 " (Halieetus?)

✓G 2825-33 " (eagle, 2827-30, 32-33 = spiz.)

✓G 2860 " (Neph?)

✓G 3041-3071 " (Falco peregrinus)

✓G 3076-83 " (Falco mex. sp.)

✓G 3092-94 " (Poythous 3092)

✓G 3112-3160 " (Falco sp.) except 3144 = columba

✓G 3169-3331 " (Circus?) 3169-94, 3330-3331, missing 319, 22, 32, 33, 3331

✓G 3430-31 " (Ar. velox?) 3430 Missing 3431

✓G 3472 " (Ar. coop?)

✓G 3536-5598 " (B. swain?) 3536-46, 48-98 Missing 3571

✓G 3649-5730 " (B. Bur?) (3649-79, 3680-3738) (3682 on corded) 82

✓G 3750-3839 " (B. reg?) (3793-3839, 3750-3792) except 3786

✓G 3913-18 " (")

✓G 3975-86 " (Bubo?)

Item	Notes	Count	Other		
✓ G 3997 - 4189	Taurus (Lybo?)	193	26		
VAM G 4286 - 4481	" (Sperdylo?)	Missing 4287, 90, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000	"	Missing 4905	18
V- G 4871 - 77	" (Sperdylo?)	4871-75, 77	Missing 4876		
✓ G 4896 - 97	" (Anser?)	4896-97			
✓ G 4899 - 4900	" (Bittern?)	4899-4900			
G 4902	" (Curlew?)	4902			
✓ G 4905 - 06	" (" ?)	4906	Missing 4905		
✓ G 4914	" (Larus?)	4914			
✓ G 4935 - 37	" (Branta?)	4935-37			
✓ G 4943	" (Goose?)	4943			
✓ G 4970 - 76	" (Branta?)	4970-76			
✓ G 4987 - 5050	" (Raven, except 4987 Duck?)	4987-5050			
X G 5098 - 5118	" (Crow except 5113, Linnaea?)	5098-5118	Missing 5113		
X G 5155 - 87	" (Parus?)	5155-87			
X G 5395 - 5410	" (Parus except 5409 par?)	5395-5410	Missing 5409		
X G 5488 - 90	" (" " 5490 " ?)	5488-90	Missing 5490		
X G 5508 - 5598	" (" ")	5508-5598			
X G 5678 and 5680	" (" ")	5678 and 5680			
X G 5686	" (" ")	5686			
✓ G 5890	" Quail?	5890			
V- G 5977 - 5991	" (Parapavo?)	5977-5991	Missing 5979-80, 82-85, 87-91		
V- G 6284 - 6374	"	6284-6374	Missing 6297, 6323		
✓ G 6731 - 6736	ulnay (Parapavo?)	6731-6736			
✓ G 6784 - 88	" (Anser?)	6784-88			
G 6924 - 33	" (Cathartes?)	6924-33			
✓ G 6915	" (Terry?)	6915			

Put 10 cont'd 9

W 66951-62	ulnae	(Cathartes)	except 59, 61-62 ^{6958 ✓}	12
V-G 6992-7092	"	(Circus?)	<u>Missing 7047, 7069, 7085</u>	101
VG 7107-(7126?)	"	("?)		20
✓G 7175-7190	"	(Buteo?)		16
✓G 7254-7342	"	("?)		38
✓G 7435-7470	"	(B. reg.)		34
✓G 7478-7480	"	(Hawk?)	(G 7478-80)	3
V-G 7511-12	"	(Aquila?)	(7511) <u>Missing 7512</u>	1
V-G 7650-65	"		7650-60, 62-65 <u>Missing 7661</u>	14
✓G 7681	"			1
✓G 7851-91	"	(Missing?)		40 (335)
V-G 8024-25	"	(Aquila?)	8024 <u>Missing 8025</u>	
G 8028-31	"	(?)	23	
V-G 8035-57	"	(Falco mex?)	<u>Missing 8042, 8049-50, 56</u>	
V-G 8095-8145	"	(Circus?)	<u>Missing 8095, 8101, 81, 38, 39, 43, 45</u>	
V-G 8161-8180	"	(F. spar?)	8162-78 <u>Missing 8179</u>	
V-G 8224	"	(?)		97
✓G 8226-8323	"	(Tyrto?)	8320 <u>Missing 8321-30, 31, 37-38, 41, 43, 44</u> 1, 2, 50, 54, 75, 78	1
✓G 8377	"	(Circus?)		
V-G 8430-31	"	(Bubo?)	8430 <u>Missing 8431</u>	2
V-G 8494-8639	"	(Spermoph?)		143
VG 8782	"	(Geococcyx)		62
X G 8957-9019	"	(Crow)		150
X G 9057	"	(Parus?)		143
X G 9063-69	"	(?)		100
X G 9101-56	"	(?)		20
X G 9258-80	"	(?)		51
				23
				335
				822

Pit 10 cent'd 10

~~G 9297 - atlas rectebra~~

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✓ G 9317	- ulna (passerine?)	1	
✓ H 1653	carpus (duck)	1	
✓ H 1674	" (goose)	1	
✓ H 1679	" (quail?)	1	
✓ H 1912-21	" (Parapaco?)	10	
✓ H 2026	" (Cathartes?)	1	
✓ H 2028	" (Eagle?)	1	
✓ H 2032	" (" ?)	1	
✓ H 2034 - 44	" (Cathartes and Vulture?)	77	
✓ H 2119 - 2195	" (Circus?)	1	
✓ H 2327	" (B. borealis?)	48	
✓ H 2350 - 2397	" (" ?)	50	
✓ H 2398 - H 2448	" (" reg?)	17	
✓ H 2487 - 2504	" (" ?)	2642	
✓ H 2638 - 53	" (Aquila?)	32	
✓ H 2723 - 54	" (F. mex?)	5	
✓ H 2778 - 82	" (F. spar?)	4	
✓ H 2801 - 4	" (Polyborus?)		
✓ H 2864 - 2934	" (Tyto except 2933-36)	73	
✓ H 2977 - 3060	" (Auro?) (missing?)	84	
✓ H 3130 - 33	" (Bubo?)	4	
✓ H 3134 - 70	" (Bubo?) (missing?)	3134	
✓ H 3232 - 74	" (passerine?)	43	
✓ H 3311 - 14	" (" ?)	4	
✓ H 3356 - 61	" (" ?)	6	
✓ H 3366 - 71	" (" ?)	6	

59

Pt 10 cont'd 11

✓H 3409-3430	Carpus 3409 [✓] , 3410-30 [✓]	22
XH 3604	" (pasein [✓])	1
✓H 3682	corvord (goose?)	2
✓H 3684-85	" "	1
✓H 3699	" (sandpiper?)	1
✓H 3782	" (Parapara [✓])	2
✓H 3818-19	" (Tern)	1
✓H 3822-23	" (Ternatoris)	6
✓H 3835	" (Apennin [✓])	
✓H 3844-49	" (Cathart [✓])	4
✓H 3863-66	" "	10
✓H 3899-3908	" (detunia?)	21
✓H 3923-43	" (B. bor?)	8
✓H 3953-60	" "	4
✓H 3973-76	" "	18
✓H 3988-4006	" (B. lin?)	12
✓H 4022-33	" (B. swain?)	4
✓H 4061-64	" (Hawk?)	5
H 4241-46	" (Aquila?)	125
V-H 4285-91	" (Aquila? except 4290 = spiz [✓])	40
✓H 4301-08	" (Haliaeetus?) 4301-02 [✓] , 04-05 [✓] , 07-08 [✓]	8
✓H 4334-35	" (Neph?)	2
✓H 4363-66	" (H4364-66 [✓] , missing 4362 [✓])	4
✓H 4425	"	1
✓H 4437-49	" (F. nex?)	13
✓H 4452-60	" "	9
✓H 4462-64	" "	3
		40

Pit 10 cont'd 12

✓ H 4631-32	coracid (Polyborus?)	2	
✓ A 4656-93	" (Tyto?)	38	
✓ A 4752-78	" (Anis)	27	
✓ A 4914-15	" (Bubo)	2	
X A 5058	" (Crow?)	1	
X A 5148-72	" (Raven?)	25	
X A 5182-86	" (parusine?)	5	154
X-A 5206-60	" (parusine, except 5249)	54	Min 5249
X A 5465-64	" (")	2	2
✓ A 5474-5501	"	26	26
✓ A 5838-40	scaps (Cathartes) 5878-79		3
✓ A 5878-81	" (5878-79 Cath, 80-81 Coragyps)	4	
✓ A 5892-5905	" (Circus?)	14	
✓ A 5927-46	" (Hawk, cf. Parusine?)	20	
✓ A 5971-75	" (" " B. swain?)	5	
✓ A 6084-96	" (" " ")	11	
✓ A 6384-85	" (Eagle, Aquila?)	2	
✓ A 6387-91	" (" " ")	5	
✓ A 6476-89	" (Falco?)	6	
✓ A 6539-57	" (Tyto?) 6549, 55	19	154
✓ A 6565-70	" (Anis?)	86	56
✓ A 6601-08	" (Bubo?)	56	296
✓ A 6713-19	" (Speotyto?)	7	
✓ A 6722	" (owl?)	1	
X A 6770-98	" (Raven?)	19	
X A 6835-48	" (parusine?)	14	
✓ A 6861	"	154	

Membe
RE 7297

RUNE Th-u

Oct 10 cont'd 13

✓ H 6895-97	scapula	6897	Neoph.	3
✓ H 6955	Radius	(Parapavo?)		1
✓ H 7212-24	"	(Cathartes, except Vultur sp. = 7216-17, 21, 22)		12
✓ H 7251-55	"	(Agouti?)	Missing 7251	4
✓ H 7589-79	"	(Hawk?)		11
H 7657	"	(?)		1
✓ H 7701-13	"			13
✓ H 7720-30	"	Missing 7723, 24		10
✓ H 7746-50	"	(Hawk?)		5
✓ H 7752-61	"	(Hawk?)		10
✓ H 7768-78	"	(?)		11
✓ H 7843-56	"	(?)		14
✓ H 7903-06	"	(?)		4
✓ H 7919-28	"	(?)		10
✓ H 7952-56	"	(?)		5
✓ H 8003-09	"	(Bubo?)		7
✓ H 8054-81	"	(Tyrto?)		28
✓ H 8109--35	"	(Cero?)		25
✓ H 8203-30	"	(Spodryto?)		28
X H 8284-85	"	(Pernis?)		2
X H 8288-98	"	(Pernis?)		11
X H 8309-15	"	(?)		7
✓ H 8355-58	"			4
✓ H 8366	"	mammal		
✓ H 8387-98	"	Missing 8387-88		12
✓ H 8400-01	"			2
✓ H 8407-13	"	Mammal		1
X H 8433	"	(Pernis?)		
✓ H 8444-47	"			4
				245

Pitco cont'd 14

✓ H8460-61	Radius	✓ 2	
✓ H8493-8514	" 498-8513	✓ 21	missed 8493-97
A8639	Fibula (Terry?)		
H8650	" ("Cathartidae"?)		
A8671-83	" (B. Bor?)		
A8696-8700	" (Bubo)		
A8786-89	" (Hawk?)		
H8812-14	" ("?)		
A9058-63	" (Caprimulgus?)		
A9066-69	" ("?)		
A9155-56	" (Eagle?)		
A9193-9201	" (F. mex?)		
H9206-08	" (Tyto?)		
H9213	" (Anis?)		
H9238-40	" (Bubo?)		
H9260-61	" (Raven?)		
H9263-65	" (Pernis?)		
H9268-69	" (Pernis?)		
H9811-13	" (Pernis?)		
X J5780-88	Quail (Raven except ^{missed} 5781-84)	✓	7
✓ J5796-5814	" (Tyto) ✓ Falco mex? 5796	✓	9
✓ J5836-37	" (Eagle?)		2
✓ J6101-06	" (^{missed} 6101 Eagle? 6102-06 ✓ Falco mex? 6101)	✓	5
✓ J6130	" (Anis?)		1
✓ J6136	" (Anis?)		1
✓ J6169-88	" (Hawk?)		20
✓ J6394-6417	" (Buteo Bor?) (6394-6417)		24
✓ J6500-05	" (Cathartes?) ^{missed} 6500-05		6
J6507-72	claw (owl?)		75
J6578-82	" (owl?)		23
J8926	Scaphidura (Eagle?)		98
J9006	curved handle (Terry?)		

Pat 10 cont'd 15

J9028

amniomorphella

J9035

"

"

K2134

misc.

✓K2162

"

K2309

"

K2312

"

✓K2328-29

"

✓K2405-

"

✓K2535-✓

"

✓K2549✓

"

73

70

55

6273

5050

4987

63

4178

4688

94

4189

3997

192

2448

2398

50

4481

4286

195

2504

2487

17

7342

7254

48

86

58

22

3730

13644

848

6374

6284

90

8323

8226

97

9019

8957

62

8639

8496

143

3839

3750

89

3060

2977

83

2936

2864

772

3531

3169

168

4

159

Cuthartes area from Pit 10 ^{checked} to cat. yet

Tarsus

✓ G2495' - 2506 = 12

Humerus

✓ G1839 - 1840 = 2

✓ G1842 - 1845' = 3

✓ G1865 - 1867 = 3

✓ G1988 - 1990 = 3

✓ G1992 - 1994 = 3

Manner

✓ F5003 - 5012 = 9
(minus 5004)

Carpus

✓ H2026, 2033 - 34

✓ H2035, 2039, 2041, 2044 } = 7

Carpus sp? ^{ulna} ^{rad.} ✓ H2035 - 36, 2038, 2040, 2043 = 5

G6929, 32, 57, 61 - 62

H7216 - 17, 7221

bea

✓ F8374 = 1 (8375 = Neophelutopo)

✓ F8376 - 8380 = 5

✓ F8395 = 1

✓ F8397 - 8401 = 6

Coracoid

✓ H3844 - 3849 = 6

✓ H3863 - 3866 = 4

Scapula

✓ H5838 - 5840 = 3

✓ H5878 - 79 = 2

Radius

✓ H7212 - 15 = 4

✓ H7218 - 20 = 3

✓ H7222 - 2423 = 2

Ulna

✓ G6926 - 28 = 3

✓ G6930 - 33 = 3

✓ G6951 - 54 = 5 (because 2535)

✓ G6956 = 1

✓ G6958 - 60 = 3

G5955 - Eagle

Beak

✓ F3179 - 80 = 2

Stemur

✓ F2469

✓ F2470 } = 2

Furcula

J6500 - 6505 = 5 (because 00703 are one)

32 ✓ *Buteo swainsoni*
 Tarsus 31 nt 31 left G 3536-3590, G 3592-3598
 G 3786

4 ✓ *Buteo lagopus*
 Tarsus 4 left, 2 nt 6 3591, G 3765, 3786, 3763, 3782

43 ✓ *Buteo borealis*
 Tarsus 43 nt 34 left } numbers in the G 3649's &
 G 39-18's?

44 ✓ *Buteo regalis*
 Tarsus 40 left 44 nt }

X7 ✓ *Buteo borealis* or *regalis* - *paysoni*
 Tarsus 7 left 7 nt

X1 ✓ *Accipiter cooperi*
 Tarsus 1 nt, G 3472

X1 ✓ *Accipiter velox*
 Tarsus 1 left G 3430

103 ✓ *Circus* 28

235 L

X1 ✓ *Vireo* L

236

Aquila chrysaetos

X Tarsus left 6 right 11
 $\frac{24}{30}$ $\frac{27}{38}$ 62429-37 66303
 62639-41 62831
 62642-47 62826
 62649-67 62768
 62669-96

39

Eagle, sp.? (probably *Aquila*)

Tarsus 2 left 1 rt 62638, 2642, 2668

4 *Spizaeus pinus*

X Tarsus 3 left 4 rt 62827, 2829, 2830, 2832, 2833, 2648

X *Urebitinga pagalis*

Tarsus 1 rt 62860, (1 left K3582, 1 rt K4004, coracoid humerus 1 left K3551, 1 left K3770)

2 *Nephelopsis americana*

X Tarsus 2 rt 2 left 62586-37, 66290, 66319

4 *Paraparus californicus*
 but not matching so = 8 indiv. (# 9/13/38)
 X Tarsus 6 left 6 rt 65977-78, 65991
 65981-83 66309
 65985-89

1 *Morphnus woodwardi*
 Tarsus, 1 left 62862

X *Teratornis merriami*

Tarsus 1 rt 1 left 62451-52
 Humerus 5 rt ?

X *Cymnagyps californianus*

Tarsus 1 left 62465

X *Haliaeetus leucacephalus*

Tarsus 3 rt, 2 left 62764-67
 62769

Neogysserus - left tibia F6167 F6173 (max & dist)

✓
X2 *Bodaurus leucigineus* ✓
Tarsus 2 left 64899-9400 ✓

X4 *Spus canadensis* ✓
Tarsus 4 st, 2 left 64871-75, 4877

X1 ✓ *Ardea herodias* ✓
Tarsus, 1 st, 1 left 64896-97, 64876
1 pr

X1 ✓ *Polypterus californicus* ✓
Tarsus 1 65890

X1 ✓ ~~*Silurus fadus*~~? *Colaptes auratus*
Tarsus 1 65113

X1 ✓ *Numenius americanus* ✓
Tarsus 1 64906

X1 ✓ *Sarus (Glaucous, occidentalis or argentatus)* ✓
Tarsus 1 64914
Tibia 1 left F7915

3 ✓ *Goose, H-*
Tarsus 3 st, 2 left 64935-37, 64975-76

X1 ✓ *Duck - Teal*
Tarsus 1 st 64987

X1 ✓ *Mourning Dove*
Humerus, 1 left 6512

X1 ✓ *Phalaropus amittus* ✓
Humerus 1 st 61847

X1 ✓ *Squatarola squatarola* ✓ *Xyechinus vociferus* ✓
Humerus 1 left 6572 X 1 left 6573
1 ✓ *Skull Charadriiform - Caracoid* left H 3695

Sept 13, 1935

Pt 10

X ~~2~~ ✓ *Selyborus*
Tarsus 1st 1 left ^{not males} 63092, 66307

X 8 ✓ *Talio mexicanus*

Tarsus 8 left, 8 nt 63043, 63050, 3055-57, 3062
63064, 63067, 63069, 3071, 3076-78
63081-83

X 3 ✓ *Talio peregrinus*

Tarsus 10 left 13 nt 63041-42, 3044-49, 63052-54
63058-61, 3063, 3065-66, 3068
63070, 3079, 3080, 3094 (with 66294)

X 7 ✓ *Talio spawerius*

Tarsus 7 left 7 nt

63142-48, 63150-56

X 1 ✓ *Talio columbarius*

30 ✓ Tarsus 1st 63149

femur 3rd - 1 left

X 1 ✓ *Coragyps occidentalis*

Tarsus 1st, 1 left 62488, 66304

X 7 ✓ *Cathartes aura*

Tarsus 7 nt 4 left 6 left

62495-2506
66339

78 ✓

✓ *Circus hudsonius*

Tarsus

50 nt

27 dist

25 prox

103

92

53 left

23 dist

16 prox

92

63169-3218, 3220-21

63223-36, 63238-56, 3238-63

63265-3329, 3329-30

66310 and etc, ?

✓ *Elanus leucurus*

femur 1st FS-482

Pt 10

6 ~~Rybo~~ *virginianus*
Tarsus 6nt 5left 63975-86 (86 & 83 are same indiv)

56 ~~Chio~~
Tarsus 56 left 4nt 64684-4721, 4723-78
66361, 66362

80 ~~Tybo~~ *alba*
Tarsus 82nt 80left 63997-4189?
13 max 12 max
13 dist 12 dist
96 104

93 ~~Spic~~ *curvicauda*
Tarsus 90nt 93left
6 dist 5 dist
96 1 max
99

235 Owls

Pit 10 (2nd level)
utd from meridian

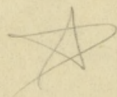
Umbeltinga fragilis

Tarsus 1 left (dist.) K3582 (3)

1 rt (prox.) K4004 (6)

~~Coracoid 1 rt K3551 (2) Bregula's~~

Humerus 1 left K3770 (6)



Aquila chrysaetos

Tarsus 12 left K3734-37

K3741

K3750

K3790

K4006 (6)

K4009

K3539 (2)

K3581 (3)

K3656 (6)

? Int femur K3530 (1)

K3538-3543 minor (2)

femur 3580 (3)

tibia 3583-84 (3)

carpus 3586-87

humer 3588 (3)

8 rt

K3733

K3738-40

K3657 (3)

K4005

K4007-8 (6)

Neophronopsis americanus

Tarsus 1 left K4094 (6) (humer. & coracoid from same section)

Tibia 2 left K4044 and 4048 (6)

ulna 3556 (2)

✓ *Phalacrocorax*

Humerus 1 left K3789 (6)

Circus hudsonius

Tarsus 6 rt

K3705 (5)

K3800

K4102-03 (6)

K4106

K4299

6 left K4104-05 (6)

4107-09

4294

2955/0

20

105

104

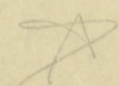
239

236

Polyborus pectoratus

left carpus K3593 (3)

"/Humerus K4005



112
29
145
147

Oct 10 (mid fest)

X *Quercus canadensis*
Tarsus, rt } ⑥
1 left }

X *Numenius americanus*
1 carpus ⑥ K4228

X *Chaepus hudsonius*
1 humerus ⑥

X *Spatula clypeata*?
1 Tarsus rt ⑥

X *Meegys errans*
1 sternum ⑥, 1 cranium ②, 1 humerus ⑥, 1 femur ⑥

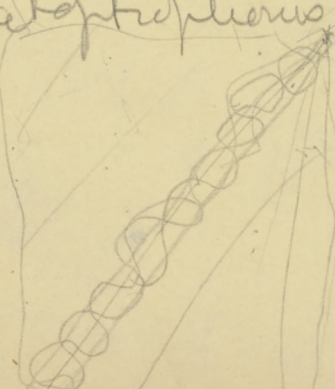
X *Meophis woodwardi*?
1 coracoid ⑥

X *Spatula clypeata*
1 Tarsus K4095

Bubo virginianus
1st hum K4052

Anser albifrons? ulna K3585 ③

Catoptrophus innuatus dist hum K4066 ⑥



Pt 10 (2nd lot)

no. in circles = same
pit data in ⑥ all in ⑥ have same
pit data, ~~as to level~~ & section etc.

X *Larus mexicanus*
2nd tibiae, humerus, tarsus (all etc.) ⑥
1 left " ⑥

X *Larus peregrinus*
2 left tarsus ⑥
1 st, 1 left tibiae ⑥

Larus sparverius - ulna ⑥

X *Ptyto patinceda*

Tarsus 5 st

K3707 ⑤

K4190-91

K4194 ⑥

K3634 ④

4 left

K4189

K4193

K4195-99

K3636 ④

K3565 femur ②

X X *Ovis*

Tarsus 9 st (Seven from ⑥, two from ③)

1 left ⑥

Humerus K3559 ②

K3553 - 55 humerus ②

3560 - 61 f. " ②

(62 - 3563) f. Tib. ②

K3566 - 67 tarsus ② st

3569 - 78 ulna ②

3590 " ③

X *Sperdyto emiculaia*

Tarsus 2 st ⑥; 4 left (five from ⑥, one from ④)

X *Paraparus californicus*

Tarsus 2 left ⑤

2 st ⑥

Tibia K3546 ②

Pt 10 (2nd br)

⑥ = under 8 ft
④ = E F F 899, 9-13 1/2 1 4 page
② = 2 1/2 - 4' in F II 2 "passenger"
③ = 4-5' 1/2 in F II
⑤ = F 10, 8 1/2 - 9' 1/2 16, 914
⑥ = 2-7' initial

X *Buteo swainsoni*

Tarsus 6 ft K3777 K3602-03 ④ 1 left ⑥
K3791
K4214-15 } ⑥ K3536 ① sternum

X *Buteo regalis*

Tarsus 3 left K3775 1 ft K3548 ② K3549?, 3551-52 ②
K4209 } ⑥
K4211 } ⑥
Stem K3557 ②

X *Buteo borealis* 6 ft K3794
K4210
K4212-13 } ⑥
K3531 ①

3768 dist
1 left K3776 ⑥
left 3798
left 4200
left 4213
left 4212

X *Teratomis merriami*

1st ulna K3763, 67 ⑥
1 left

Tarsus 1 prox } K3764, 4244 ⑥
1 dist }

1 st coracoid K3595 ③
1 ulna K3537 ②
1 tibia, 1 scap ⑥

X *Ceryle alcyon*

Tarsus 1 ft K4041 ⑥
2 left femora ⑥
1st femur ⑥
1 tibia ⑥
1st femur ⑤

X *Cathartes aura*

Tarsus 1 left K4042 ⑥ K3558 sternum ②
Scap K3625 ④
3 coras, K3534, 3512, 4045 ⑥
1 humerus ⑥

Taurus Pt 10

- 6 *Halimastur* G2764-69
 1 *Gymnogyps* G2465
 4 *Neofluviator* G2536-37, G6290, G6319
 15 *Parafavo* G5977-91 (probably, tho have found only 77, 78, 81, 86)
 G6309
 76 *Agelaius* G2629-2696 (probably, tho 38, 42, and 48 are too worn for sp. ident.)
 G2831, 2826 48 missing
 5 *Eagle sp.* G6303, 62648
 3 *Polyborus* G3092, 94, G6307
 13 *Cathartes* G2495-2506, G6339
 1 *U. fragilis* G2860
 10 *Falco mexicanus* G3043, 50-51, 55-57, 68, 67, 69, 71
 29 *Falco peregrinus* G3041-42, 44-49, 52-54, 58-63, 65-66, 68, 70, 76-83, G6294
 2 *Coragyps* G2488, G6304
 5 *Spizella* G2827, 29, 30, 32-33
 14 *Falco sparverius* G3142-56 (except 3149)
 2 *Verreauxia* G2451-52
 — *Passerines* G6311, 16, 25, 28, 57, 61-62, G6299
 201 *Circus hudsonius* G3169-3218, 3220-21, 23-36, 38-36, 58-63, 65-3331, G6285-86, 88, 91-92, 96, 6300-01
 G6306, 10, 17, 20, 22, 26-27, 29-31, 33, 36-37, 41-44, 47-51, 53, 55, 60, 65-69
 12 *Bubo virginianus* G5975-86
 207 *Tyto alba* G3997-4189 (- one in 4000's), G3093, G6315, 18, 46, 54, 59, 66, 6298, 6289, 95, 6385
 206 *Speotyto cunicularia* G4286-4481, G6293, G6314, 21, 38, 38, 58, 64-65, 6340
 96 *Asio* G4684-4778 (- one), G6361, 6363?
 7 *Owl, sp.* G6366, 67, 63, 62, 6287, 6370, 6356
 1 *Falco columbarius*? G3149
 1 *Accipiter velox* G3430
 Red Tail Hawk many
 Rough leg " many
 3 *Quercus canadensis* G4873-74, 77
 3 *Opus mexicanus* G4871-72, 75
 2 *Aida herodias* G4896-97
 2 *Botaurus lentiginos* G4899-4900

Teal, *Querquedula*? sp. G4987
 Taurus G4914
Numenius americanus G4906
Sturnella? G5113
Lophortyx G5890
Zone tail Hawk? G3472
 Swainson hawk many

Total from Homodepanders = 84 extinct = 11.990

Total combined call = 707 " 30 = 4.290

Total " Pit 16 = 1593 " 572 = 3690

" " Pit 4 = 880 " 424 = 4890

" " " 3 = 600 " 191 = 82.90

" " " Acad = 305 " 130 = 42.590

3378

1317 = 3920

	Pit 10	corrected Pit 10	Pit 16	Pit 4	Pit 3	Acad	Total 4 Plants
Teratomia ✓	6	5	13	20	22	3	58
Breagyps ✓	—	—	1	3	7	1	12
Gymnops ✓	1	1	4	33	89	6	132
Wetmoreops ✓	—	—	—	4	—	2	2
Unibitinga ✓	3	2	27	17	9	3	56
Murphus ✓	1	1	3	5	7	1	16
Apule ✓	47	46	382	238	86	20	726
Spizactus ✓	4	4	35	30	8	7	80
Neogyps ✓	1	1	32	20	4	3	59
Neophantops	3	3	36	40	18	10	107
Polybomus	1	2	141	40	29	12	225
Halacichs ✓	3	3	66	28	11	11	116
Stix breca *	3	3	5	2	2	1	10
Coragyps *	3	3	25	61	41	8	135
Total extinct rept.	21	21	346	240	147	51	929
" large rept.	65	63	563	353	398	405	55
Total gall species	704	749	1593	880	600	305	3378
Total extinct fly	72	71	768	539	331	85	1723
as above but including	72	71	773	541	333	86	1733
Total extinct including	21	21	401	242	147	49	939
Total of 3 Mus pits	3013	—	—	—	—	—	—
Total reptiles	658	331	855	628	497	137	—
Chubs	360	267	83	34	105	27	—

Total of 3 Mus pits 3013 - large rept. 1204 = 39.170; extinct + large 1638 = 53.390

5000 in cludes
 P 2, 3, 4, 13, 16, 60, 61, 67, 77, aced

①

Cathartes L

KEEP

✓

Species	Pt 10	Pt 3/pth	Pt 4	Pt 16	Total Pleists
Podilymbus podiceps				1	1
Phalacrocorax auritus	1				0
Ardea herodias	1				8
Casmerodius alba					1
Egretta thula?				1	5
Bubulcus ibis					1
Podiceps leucogaster	2	1			4
Nycticorax nycticorax					1
*Ciconia maltha ✓ *	1	2	2	8	10
Nycticorax nycticorax	0	0	0	0	1
Geese (Mareca americana)	3	8	11	22	44
*Querquedula macraria ✓ *	0	0	3	2	3
Quail	2	4	2	4	32
Cathartes aura	8	3	1	4	2
*Coragyps occidentalis ✓ *	3	41	18	61	25
Gymnogyps californianus	1	89	11	33	4
*Brachyotus clarkii ✓ *	0	7	1	3	1
*Tyrannus merriami ✓ *	5	22	5	20	13
Elanus leucurus	1	1			1
Buteo atricapillus	0			2	2
Accipiter velox	1	1	1	2	4
Accipiter cooperii	1	3	16	17	13
Circus hudsonius	84	31	8	4	52
Buteo borealis	45	7	1	8	17
" swainsoni	38	19	1	1	38
" lagopus	4				4
" regalis	44	10	1	4	45
B. species?	0	0	1	2	4
*Neotoma elegans ✓ *	0	0	4	0	6
*Morphnus woodwardi *	1	7	0	3	24
*Amelospiza fasciata *	2	9	4	17	27
Aquila chrysaetos	46	86	58	238	382
*Spizella socialis *	4	8	3	30	35

Species	Pt 10 P	Pt 3	Pt 3B	Pt 4	Pt 16	Plants Total
<i>Haliaeetus leuccephalus</i>	3	11	41	28	66	172
* <i>Neogypso eranus</i> *	1	4	2	20	32	110
* <i>Neophrontops americanus</i> *	3	18	10	40	36	140
* <i>Polyborus preatorius</i> *	2	29	15	40	144	256
<i>Falco mexicanus</i>	9	2	2	2	3	13
" <i>peregrinus</i>	13	1	1		3	10
" <i>columbarius</i>	3	2	1	1	3	8
" <i>sparverius</i>	1	3	4	8	24	43
<i>Sophistyx californica?</i>	1			7	84	97
* <i>Paraparus californicus</i> *	10	42	24	173	238	557
<i>Quercus canadensis</i>	5	2	6	6	6	36
" <i>americana?</i>	0		1		1	2
<i>Fulica americana</i>	0			1		1
<i>Oxyechus vociferus</i>	1				14	17
<i>Squatarola squatarola</i>	1			1		2
<i>Capella delicata</i>			1 F			8
<i>Numenius americanus</i>	1				1	5
<i>Phaeopus hudsonius</i>	1	2		1		4
<i>Catoptrophilus inornatus</i>	1					0
<i>Todanus melanoleucus</i>	0				12	17
<i>Zonotrichia sp?</i>	0				1	1
<i>Limn. odonatus griseus</i>	0				3	3
<i>Limosa?</i>	0	1				2
<i>Recurvirostra americana</i>	0					1
<i>Sanderling or Chalarope</i>	0				16	16
<i>Thalassidroma sp.</i>	0				1	9
<i>Pissa?</i>	0					1
<i>Sarus brachyphala</i>	0				1	1
" <i>sp?</i>	1					

Species	Pt 10	Pt 3	Pt 13	Pt 4	Pt 16	Pl. Totals
<i>Columba fasciata</i>	0			1	1	2
* <i>Ectopistes migratorius</i> (*)	0	0		0	1	2
<i>Penaidura macroura</i>	1	5			17	26
<i>Geococcyx californianus</i>	0	1		4	9	16
<i>Tyto alba</i>	100	32		3	2	63
<i>Otus asio</i>		1			5	7
<i>Bubo virginianus</i>	6	6	6	21	59	112
<i>Glaucidium gnoma</i>		1?			1?	2
<i>Speotyto cunicularia</i>	104	14		3	15	35
* <i>Nyctalex asio</i> *	57	2		2	5	12
<i>Cryptolau acadica</i> (36 only)		27	1	5	18	65
<i>Colaptes cafer</i>						
<i>Asyndesmus leirsi</i>						
Troy Woodpecker						
<i>Tyrannus sp.</i>					1	1
<i>Oreoscoptes alpestris</i> (37 only)						
<i>Apelocoma calif.</i>					3	3
<i>Pica nuttalli</i>	1	12	4	11	91	126
<i>Corvus corax</i>	32	11	2	5	15	37
<i>Corvus cryptoleucus</i>	0					
" <i>brach. hesperis</i>	12	1				5
" <i>cawinus</i>	1		2	2		10
<i>Centurus</i> (not A.M.)						
<i>Toxostoma redivivum</i>					2	2
<i>Oreoscoptes montanus</i>					1	1
<i>Turdus migratorius</i>					14	14
<i>Sialia</i> (36 only)						

4

Callinectes
E. magnirostris

Species	Pt 10.	Pt 3	Pt 13	Pt 4	Pt 16	Totals
<i>Bombus cedrorum</i> (none?)						
<i>Senecio ludovicianus</i>					1	1
<i>Sturnella neglecta</i>	74	3	1	4	12	22
<i>Ogelains</i>				1	9	10
<i>Euphagus</i> - none						
<i>Detenus</i>						
<i>Molothrus ater</i>					1	1
<i>Cyanocitta stelleri</i>		1			*	1
<i>Spanner</i> (none)						

Totals	749	1596 597	880	1596	4033 4027
Species	48	46 50	45	64	88
Extinct species	10	12	14	14	16
Pt 2 = 45 ext. indiv.	32	191	424	578	1649
" 9 = 14 ext. indiv.	4,270	32,090	48,190 48,190	35,990	41,990
" 13 = ²⁴⁵ 68 Passerines total	120		20	163	
" 60 41 " sp.	5		6	16	
" 61 152 " ext	0		0	1	
" 67 & P.D. 137 " sp. absent loc.	0		2	5	
" 77 97 " indiv	0		11	99	
Dead. 300					
Pt 3 597					
" 4 880					
" 16 1596					
4033					
4027					

* Based on early count of passives
from *hurreii* (to be revised?)

	Pt2	Pt3	Pt4	Pt9	Pt13	Pt16	Pt60	Pt61	Pt67	Pt77	Acad Pit	Total Pleist	Pt10	Pt67	PtD
* Total individuals	45	597	880	14	245	1596	141	152	138	97	286	4204	749	96	42
Total individuals excluding passerines	41	569	857	13	236	1449	138	151	138	96	278	3956	629	96	42
Total sps.	(3) 21	(6) 50	(4) 35	(1) 13	(4) 34	(13) 79	(2) 30	(1) 34	(0) 38	(1) 24	(4) 66		(5) 52	(0) 29	(0) 19
" extinct sps.	7	12	14	3	12	14	10	11	12	10	15	16	10	11	9
" extinct individuals	18	191	425	3	87	578	59	59	68	43	96	1624	37	20	passerines included

pencilled corrections for omission of Pit₃ above 1' level

	Pit 2	Pit 3	Pit 4	Pit 9	Pit 13	Pit 16	Pit 60	Pit 61	Pit 67	P.D.	Pit 77	Acad.	Pit 61 and 67 T.P.D.	Total Pit 61	Pit 81	Pit 81	Pit 37	Pit 36	Pit 28	Pit 10	
② Totals without passerine + woodpeckers	41	531	857	13	236	1440	140	151	96	42	96	275	289	4088	9	8	41	161	132	135	629
③ Total sps. (pass.)	18	47	47	12	30	66	26	33	29	49	23	64	40	85	8	7	21	14	37	23	47
④ ext. ind. sps. (pass.)	7	12	14	3	11	14	10	11	11	9	10	15	13	16	4	0	4	1	8	3	10
⑤ Restrict (minus indiv. pass.)	18	191	425	3	87	573	59	59	37	29	43	100	125	1652	4	0	4	1	28	5	32
⑥ Total passerine + woodpeckers																					
⑦ Total ext. ind. sps.																					
⑧ Total ext. indiv. sps.																					
Total all indiv. (a + e)																					
Total all sps. (b + f)																					
Total all ext. ind. sps. (c + g)																					
Total all ext. indiv. sps. (d + h)																					
Ratio c to b	38.8%	25.5%	29.8%	25.0%	36.7%	21.2%	38.5%	33.4%	38.0%	47.4%	43.5%	23.5%	32.5%	21.9	56%	0	19.0%	7.1%	21.6	13.0	21.3%
" d to a	44.0%	33.6%	49.5%	23.0%	36.8%	39.7%	42.1	39.1%	38.5%	69.1%	44.7%	36.4%	43.3%	40.4	44.4%	0	9.7%	0.6%	21.2	3.7	5.0%
Total raptors	39	496	628	9	187	957	176				79	138	237	2948				87			596
" owls	2	8970	34	3	7	105	9				1	28	24	319	306			23			267
" hawks	5	57	40	2	3	49	7				7	15	40	265	250			26			218
" falcons	0	87	11	0	8	33	2				1	7	4	76	75			2			32
" eagles	14	1262	342	3	108	545	65				26	47	54	1358	1358			29			57
" longvultures	3	118	56	0	17	18	14				24	10	70	333	333			4			6
" small "	6	44	65	1	19	27	10				10	9	20	220	220			4			11
Neoph. & Poly. + Striped	9	4946	82	0	26	185	13				5	23	27	414	413			98			5

$.36 = 0.1\%$ percent per
 0.5 (3, 4, 16) 0.5

Columbi	<u>Pt 10</u>	<u>0.5</u>	<u>0.1</u>	<u>.36</u>
Cicon	0.5	1.80	1.0	3.6
Anser	0.5	1.8	3.0	10.8
Falcon	44.0	158.4	60.0	216.0
Galli	1.5	5.4	17.5	63.0
Gru	0.5	1.8	0.5	1.8
Charad	1.0	3.6	2.0	7.2
Columb	0.1	0.36	1.0	3.6
Strigi	36.0	129.6	7.0	25.2
Pass.	16.0	57.6	7.0	25.2
		360.36		756.76

3.6	3.6	17.5	
44	60	3.6	36
144	216.0	1050	7
144		525	252
158.4		630.6	

3.6	36
36	16
216	216
108	36
129.6	57.6

Pt 10 nearest Pleisto aver Pleisto 3,4,16

Cicon	0.5	0.5	0.75	1.0 90	0.8	= 1
Anser.	0.6	0.5	2.0 ✓	3.0	3.1	= 3
Falcon	43.9	44.0	53.2 ✓	62.0	60.4	= 60
Gull	1.4	1.5	7.1 ✓	15.0	17.6	= 17.5
Grouse	0.6	0.5	0.8	0.6 or 1.0	0.5	= 0.5
Charad	0.8	1.0	0.6	2.0	2.0	= 2
Columb	0.1	0.1	0.1	0.5	0.8	= 1
Strig	36.0	36.0	14.0 ✓	7.0	7.2	= 7
Paso	16.0	16.0	10.0 ✓	5.0	6.9	= 7
	990	885			99.0	

$$\begin{array}{r}
 1069 \\
 3080 \overline{) 214.00} \\
 \underline{18480} \\
 29200 \\
 \underline{1072} \\
 3080 \overline{) 222.00} \\
 \underline{21560} \\
 6400
 \end{array}$$

$$\begin{array}{r}
 10045 \\
 3080 \overline{) 14.000} \\
 \underline{12240} \\
 17600
 \end{array}$$

$$\begin{array}{r}
 1008 \\
 3080 \overline{) 25.000} \\
 \underline{1020}
 \end{array}$$

$$\begin{array}{r}
 1020 \\
 3080 \overline{) 63.00} \\
 \underline{6160} \\
 1400
 \end{array}$$

$$\begin{array}{r}
 1176 \\
 3080 \overline{) 544.0} \\
 \underline{3080} \\
 23600 \\
 \underline{21560} \\
 20400
 \end{array}$$

$$\begin{array}{r}
 1607 \\
 3080 \overline{) 1860.0} \\
 \underline{18480} \\
 12000
 \end{array}$$

$$\begin{array}{r}
 031 \\
 3080 \overline{) 96.00} \\
 \underline{9240} \\
 3600
 \end{array}$$

$$\begin{array}{r}
 00084 \\
 3080 \overline{) 26.000} \\
 \underline{24640} \\
 13600
 \end{array}$$

	P.T. 10	%	% of circle	
Pelecaniformes	1	0.1	.36	54
Ciconiiformes	4	0.5	1.80	382
Anseriformes	5	0.6	2.16	101
Falconiformes	329	43.9	158.04	68
Galliformes	11	1.4	5.04	144
Strigiformes	5	0.6	2.16	33
Charadriiformes	6	0.8	2.88	782
Columbiformes	1	0.1	.36	
Scipiformes	367	36.0	129.6	
Passeriformes	120	16.0	57.6	
	<u>749</u>		<u>360.00</u>	

$$749 \overline{) 1.001}$$

$$749 \overline{) 4.000}$$

$$749 \overline{) 5.000}$$

$$749 \overline{) 329.0}$$

$$749 \overline{) 11.00}$$

$$749 \overline{) 6.000}$$

$$749 \overline{) 267.00}$$

$$749 \overline{) 120.0}$$

$$749 \overline{) 158.04}$$

$$749 \overline{) 1.80}$$

$$360^\circ$$

$$190 = 3.6^\circ$$

$$0.190 = .36^\circ$$

$$0.590 = 1.80^\circ$$

$$0.690 = 2.16^\circ$$

$$0.890 = 2.88^\circ$$

$$1.490 = 5.04^\circ$$

$$36.090 = 129.6^\circ$$

$$16.090 = 57.6^\circ$$

$$43.990 = 158.04^\circ$$

$$360.00$$

Combined 3, 4, 16 (all clients)

Colymbiformes	1		Acad	31
Ciconiiformes	26 (+ 22 + 0) = 48 ✓			29
Ameghiiformes	96 (+ 29 + 8) = 133 ✓		10	60
Falconiformes	1860 (+ 37 + 6 + 180 + 111 + 78 + 213 + 73) = 2549 ✓		110	
Galliformes	544 (+ 99) = 643 ✓		35	
Gruiiformes	16 (+ 16) = 32 ✓		4	
Charadriiformes	62 (+ 10) = 72 ✓		20	
Columbiformes	25 (+ 5) = 30 ✓		3	
Cuculiformes	14 (+ 1) = 15 ✓		2	
Strigiformes	222 (+ 2 + 3 + 7 + 9 + 25 + 1 + 23) = 291 ✓		28	
Passeriformes	214 (+ 4 + 2 + 9 + 28 + 3 + 1) = 261 ✓		11	
	<u>3080</u>		<u>283</u>	

48
133
2549
643
32
72
30
15
291
261
4074
283
4357

291
28
31
4
28
23
2
9
66
91 + 6
28
4
255
6
261
11
272
4357
272
4089

643
35
678
69
222
291
28
319
11
63
57
267

4074
278
4352
10
1
5
1
1
5
32
1
1
1
319
4352
272
4080

2
3
7
9
25
1
22
69
222
291
28
319

Pit 4

Pit 3

Ciconiiformes	8	1.0%	6	1.0%
Anseriformes	27	3.1	12	2.0%
Falconiformes	594	67.5	414	69.4%
Galliformes	180	20.4	42	7.1%
Strigiformes	7	0.8	2	0.3%
Charadriiformes	2	0.2	4	0.6%
Columbiformes	1	0.1	5	0.8
Cuculiformes	4	0.4	1	0.1%
Strigiformes	34	3.9	83	14.0%
Casseriformes	23	2.6	28	4.7%
	880	100%	597	100%

$$\begin{array}{r} 880 \overline{) 8.000} \\ \underline{7920} \\ 800 \end{array}$$

$$\begin{array}{r} 880 \overline{) 2.000} \\ \underline{1760} \\ 240 \end{array}$$

$$\begin{array}{r} 880 \overline{) 27.00} \\ \underline{2640} \\ 600 \end{array}$$

$$\begin{array}{r} 880 \overline{) 1.000} \\ \underline{880} \\ 120 \end{array}$$

$$\begin{array}{r} 880 \overline{) 594.0} \\ \underline{5280} \\ 6600 \\ \underline{6160} \\ 4400 \\ \underline{4400} \\ 204 \end{array}$$

$$\begin{array}{r} 880 \overline{) 4.000} \\ \underline{3520} \\ 480 \end{array}$$

$$\begin{array}{r} 880 \overline{) 180.0} \\ \underline{1760} \\ 400 \end{array}$$

$$\begin{array}{r} 880 \overline{) 34.00} \\ \underline{2640} \\ 760 \end{array}$$

$$\begin{array}{r} 880 \overline{) 7.000} \\ \underline{7040} \end{array}$$

$$\begin{array}{r} 880 \overline{) 23.00} \\ \underline{1760} \\ 5400 \\ \underline{5280} \\ 1200 \end{array}$$

$$\begin{array}{r} 597 \overline{) 6.00} \\ \underline{597} \\ 30 \end{array}$$

$$\begin{array}{r} 597 \overline{) 12.00} \\ \underline{1194} \\ 60 \end{array}$$

$$\begin{array}{r} 597 \overline{) 414.0} \\ \underline{3582} \\ 5580 \\ \underline{5373} \\ 2070 \end{array}$$

$$\begin{array}{r} 597 \overline{) 2.000} \\ \underline{1791} \\ 2090 \end{array}$$

$$\begin{array}{r} 597 \overline{) 42.00} \\ \underline{4179} \\ 210 \end{array}$$

$$\begin{array}{r} 597 \overline{) 4.000} \\ \underline{3582} \\ 4180 \end{array}$$

$$\begin{array}{r} 597 \overline{) 1.000} \\ \underline{597} \\ 403 \end{array}$$

$$\begin{array}{r} 597 \overline{) 5.000} \\ \underline{4776} \\ 2220 \end{array}$$

$$\begin{array}{r} 597 \overline{) 83.0} \\ \underline{597} \\ 2330 \\ \underline{1791} \\ 5390 \\ \underline{5390} \\ 0 \end{array}$$

$$\begin{array}{r} 597 \overline{) 28.00} \\ \underline{2388} \\ 4120 \end{array}$$

PT 16

Colymbiformes	1	0.190
Ciconiiformes	12	0.7590
Anseriformes	57	3.45
Falconiformes	852	53.2
Galliformes	322	20.1
Struthioniformes	7	0.45
Charadriiformes	56	3.5
Columbiformes	19	1.2
Cuculiformes	9	0.55
Strigiformes	105	6.55
Passeriformes	163	10.0
	1603	100.0

$$\begin{array}{r} 53 \\ 67 \\ 69 \\ \hline 01 \\ 4) 25062414 \\ 200 \\ \hline 5062414 \\ 1860 \end{array}$$

$$\begin{array}{r} 23 \\ 28 \\ 163 \\ \hline 214 \\ 214 \end{array} \quad \begin{array}{r} 222 \\ 322 \\ 322 \\ \hline 544 \end{array} \quad \begin{array}{r} 322 \\ 180 \\ 42 \\ \hline 544 \end{array}$$

$$\begin{array}{r} 2 \\ 4 \\ 10 \\ 6 \\ \hline 22 \\ 22 \end{array} \quad \begin{array}{r} 34 \\ 83 \\ 125 \\ \hline 222 \end{array} \quad \begin{array}{r} 3 \\ 14 \\ 6 \\ \hline 312317 \end{array}$$

$$\begin{array}{r} 1603 \overline{) 110000} \\ 1603 \overline{) 120000} \\ 1603 \overline{) 5700} \\ 1603 \overline{) 8520} \end{array}$$

$$\begin{array}{r} 1603 \overline{) 7000} \\ 1603 \overline{) 5600} \\ 1603 \overline{) 1900} \end{array}$$

$$1603 \overline{) 1630}$$

$$1603 \overline{) 322000}$$

$$\begin{array}{r} 1603 \overline{) 9000} \\ 1603 \overline{) 10500} \end{array}$$

Combined Pleists

Ret 3,4,14 70

Columbiformes	✓	0.1	0.1	1	0.1
Ciconiiformes	58	1.3	1.5	24	0.8
Anseriformes	193	4.5	5.0	94	3.1
Falconiformes	2659	61.0	61.0	1860	60.4
Galliformes	678	15.5	15.0	544	17.6
Gruiiformes	36	0.8	1.0	14	0.5
Charadriiformes	92	2.1	2.0	63	2.0
Columbiformes	33	0.7	1.0	25	0.8
Cuculiformes	17	0.3	0.5	14	0.4
Strigiformes	319	7.3	7.0	222	7.2
Passeriformes	272	6.2	6.0	214	6.9
			100.5	3080	99.8

4358

$$\begin{array}{r} 4358 \overline{) 272.00} \\ \underline{26148} \\ 10520 \end{array}$$

$$\begin{array}{r} 4358 \overline{) 17.000} \\ \underline{1003} \\ 4358 \overline{) 33.000} \\ \underline{30506} \\ 2494 \end{array}$$

$$\begin{array}{r} 3080 \overline{) 214.00} \\ \underline{.06} \end{array}$$

$$\begin{array}{r} 4358 \overline{) 319.00} \\ \underline{30506} \\ 13940 \\ \underline{13074} \\ 866 \end{array}$$

$$\begin{array}{r} 4358 \overline{) 92.00} \\ \underline{1021} \\ 8716 \\ \underline{4840} \end{array}$$

$$\begin{array}{r} 4358 \overline{) 2659.0} \\ \underline{26148} \\ 4420 \\ \underline{4355} \\ 65 \end{array}$$

$$\begin{array}{r} 4358 \overline{) 36.000} \\ \underline{34864} \\ 11360 \end{array}$$

$$\begin{array}{r} 4358 \overline{) 678.00} \\ \underline{4358} \\ 24220 \\ \underline{21790} \\ 24300 \end{array}$$

$$\begin{array}{r} 4358 \overline{) 193.00} \\ \underline{17132} \\ 21680 \\ \underline{21790} \end{array}$$

$$\begin{array}{r} 4358 \overline{) 58.00} \\ \underline{4358} \\ 14420 \end{array}$$

2630
26
2633

Anserinus & macrogama 103

$$\begin{array}{r} \text{Pt 10} \\ 629 \overline{) 5.000} \\ \underline{5032} \end{array}$$

$$\begin{array}{r} \text{Pt 3} \\ 569 \overline{) 12.00} \\ \underline{1038} \end{array}$$

$$\text{Pt 4 } 857 \overline{) 27.00}$$

$$\text{Pt 9 } 13 \overline{) 1.00}$$

$$\text{Pt 13 } 236 \overline{) 16.00}$$

$$\begin{array}{r} \text{Pt 36} \\ 132 \overline{) 11.00} \\ \underline{108} \end{array}$$

$$\begin{array}{r} \text{Pt 60} \\ 140 \overline{) 2.00} \\ \underline{140} \end{array}$$

$$\begin{array}{r} \text{Pt 61} \\ 151 \overline{) 2.00} \\ \underline{151} \end{array}$$

$$\begin{array}{r} \text{Pt 77} \\ 96 \overline{) 2.00} \\ \underline{192} \end{array}$$

$$\begin{array}{r} \text{Pt 16} \\ 1440 \overline{) 57.00} \\ \underline{5760} \end{array}$$

Ans. + Charadrius fornes & macrogama

$$\begin{array}{r} \text{Pt 10} \\ 629 \overline{) 11.00} \\ \underline{629} \end{array}$$

$$\text{Pt 4 } 857 \overline{) 30.00}$$

$$\begin{array}{r} \text{Pt 3} \\ 569 \overline{) 16.00} \\ \underline{1138} \end{array}$$

$$\text{Pt 9 } 13 \overline{) 2.00}$$

only 22
hatched 21
pale 4
8
vultures 13
eggs 14

47
22
69 $\overline{) 48.0}$
41 4
6 60
3 90
69 $\overline{) 14.0}$
13 8
200

236 ausens

$$\begin{array}{r} 29 \\ 245 \overline{) 16.00} \\ 1470 \end{array}$$

pt 13

$$\begin{array}{r} 41 \\ 45 \overline{) 2.00} \\ 180 \end{array}$$

PT 2

PT 60

$$\begin{array}{r} 142 \overline{) 2.00} \\ .0170 \end{array}$$

pt 36

$$\begin{array}{r} 160 \overline{) 11.00} \\ 132 \\ 28 \\ 140 \end{array}$$

PT 10 629

$$\begin{array}{r} 120 \\ 749 \overline{) 5.000} \\ 4494 \end{array} \quad \begin{array}{r} .0066 \\ 35060 \end{array}$$

PTs 61, 67, P.O

$$\begin{array}{r} 289 \\ 3 \\ 292 \overline{) 2.000} \\ 1752 \\ 2480 \end{array}$$

$$\begin{array}{r} 152 \overline{) 2.00} \\ .01 \end{array}$$

$$\begin{array}{r} 96 \\ 97 \overline{) 2.00} \\ .02 \end{array}$$

PT 2

$$245 \overline{) 0}$$

PT 9

$$\begin{array}{r} 15 \overline{) 1.00} \\ .06 \end{array}$$

Charadriiformes

nr 3

$$569 \overline{) 4.000}$$

61 and 67 P.O

$$\begin{array}{r} 292 \overline{) 4.00} \\ .01 \end{array}$$

PT 36

$$\begin{array}{r} 160 \overline{) 5.00} \\ .03 \end{array}$$

ausens & charads

pass.

$$\begin{array}{r} 1603 \overline{) 157.00} \\ .09 \end{array}$$

	Total Pleistocene Pits	Pleistocene Pit No. 4	Pit 10	Pt 3
Podilymbus podiceps	1	-	-	-
Columbus, sp.	1	-	-	-
Phalacrocorax auritus	-	-	1	-
Ardea herodias	10	-	1	3
Casmerodius albus	1	-	-	-
Egretta thula?	5	-	-	-
Butorides virescens	1	-	-	1
Botaurus lentiginosus	5	-	2	-
Nycticorax nycticorax	1	-	-	-
✓ Mycteria wetmorei	1	-	-	-
Ajaia ajaja	1	-	-	2
✓ Ciconia maltha	32	8	1?	-
Plegadis guarauna	1	-	-	X
Cygnus columbianus	1	-	-	-
✓ Anabernicula minuscula	24	2	-	-
Other geese (5 spp.)	89	21	3	8
Ducks (6 spp.)	79	4	2	4
	10 - 19			
Cathartes aura	24	4	8	3
✓ Coragyps occidentalis	201	61	3	41
Gymnogyps californianus	214	33	1	89
✓ Breagyps clarki	22	3	-	7
✓ Teratornis merriami	98	20	5	22
Elanus leucurus	2	-	1	1
Astur atricapillus	2	-	-	-
Accipiter velox	4	1	1	1
Accipiter cooperi	44	16	1	3
Circus hudsonius	64	8	84	31
Buteo borealis	49	8	45	7
Buteo swainsoni	46	1	38	19
Buteo lagopus	1	-	4	-
Buteo regalis	46	4	44	10
Buteo species?	9	2	-	-
✓ Wetmoregyps daggetti	6	4	-	-
✓ Urubitinga fragilis	78	17	2	9
✓ Morphnus woodwardi	24	5	1	7
Aquila chrysaetos	900	238	46	86

1630
x 230
3660

2660
110
2550

425
x 23
9775

336
78
414

✓ Spizaetus grinnelli	97	30	4	8
Haliaeetus leucocephalus	172	28	3	11
✓ Neogyps errans	71	20	1	4
✓ Neophrontops americanus	142	40	3	18
✓ Polyborus prelutosus	272	40	2	29
Falco mexicanus	13	2	9	2
Falco peregrinus	10	-	13	1
Falco columbarius	8	1	3	2
Falco sparverius	45	8	7	3
Lophortyx californica?	110	7	1	-
✓ Parapavo californicus	568	173	10	42
Grus canadensis	33	6	5	2
Grus americana?	2	-	-	-
Fulica americana	1	1	-	-
Oxyechus vociferus	18	-	1	-
Squatarola squatarola	2	1	1	-
Capella delicata	8	-	-	1
Numenius americanus	5	-	1	-
Phaeopus hudsonius	4	1	1	2
Catoptrophorus u. ornatus	-	-	1	-
Totanus melanoleucus	19	-	-	-
Sandpiper	1	-	-	-
Limnodromus griseus	3	-	-	-
Limosa?	2	-	-	1
Recurvirostra americana	1	-	-	-
Shorebird, 2 sps.	28	-	-	-
Rissa?	1	-	-	-
Larus brachyrhynchus	1	-	-	-
Larus, sp.?	-	-	1	-
Columba fasciata	2	1	-	-
✓ Ectopistes migratorius	3	-	-	-
Zenaidura macroura	28	-	1	5

Geococcyx californianus	17	4	± 1
Tyto alba	72	3	100 32
Bubovirginianus	114	21	6 6
Otus asio	9	-	- 1
Glaucidium gnoma?	3?	-	- 1?
Cryptoglaux acadica	1	-	- 1
Speotyto cunicularia	36	3	104 14
✓ Strix brea	13	2	- 2
Asio (2 sps.)	71	5	57 27
Total indivs.	4088	857	628 (omit hawk) 569
Total species	45 85	47	47 47
Total extinct indivs	1652	425	3231 (omit hawk) 191
Total extinct sps.	16	14	109 (") 12
Ratio extinct to total sps.	3.7% 18.4	29.8%	20.9% 25.5%
" " " " indivs.	40.4	49.5	5.0 33.6%
Total raptors	2986	628	596 496
Ratio % of large (condors & eagles)	56.6%	49.0%	63.3% 10.6%
% of small, hawks, owls, falcons	22.1%	32.6%	13.5% 86.7%
% of med., vultures (old & new world) and Polyborus	21.3	18.4%	23.2% 2.7%

final copy
 subtracts from
 pit 3 all specimens
 Thus changing totals for pit 3
 Plants pits

314
 13
 306
 labelled as
 Taken above 1 'main
 1
 5 combined
 40/500

	all Pleist pits	Pit 3	Pit 4	Pit 10	
Cathartes	18	2	4	8	} Not included because of intermediate size typical rather "smaller" "large"
Coragyps	198	38	61	3	
Colaptes	271	28	40	2	
Melospiza	142	18	40	3	} included
Agelaius	70	3	20	1	

Totals
 from the
 chart
 in book

86	145	16
134	85	517
220	230	523

The lesser vultures (Cathartes, Coragyps & Neophelinus) and the Caracara, being intermediate in size, are not included in the chart which contrasts the occurrence of large and small ~~birds~~ raptors.

39
 1808.1
 62
 56
 2

868
 0260N
 378
 322
 56

139
 1808.1
 236
 119
 117

Pit 3

Pit 4

Pit 10

Condors & Eagles
Including T. nativus
% to total

239
52%

398
63%

63
10%

Nautilus, owls, falcons
% to total

134
29%

85

13%

517

86%

Dessu cultures
(Ath., cor. Neoph.)
and Caracara
% to total

1870
86

2370

145

16

459

628

596

$$\begin{array}{r} 459 \overline{) 239.0} \\ \underline{229.5} \\ 9.50 \\ \underline{9.18} \end{array}$$

$$\begin{array}{r} 459 \overline{) 134.0} \\ \underline{91.8} \\ 42.20 \\ \underline{41.31} \end{array}$$

$$\begin{array}{r} 459 \overline{) 86.0} \\ \underline{45.9} \\ 40.10 \\ \underline{36.72} \\ 3.380 \end{array}$$

$$\begin{array}{r} 459 \overline{) 220.0} \\ \underline{183.6} \\ 36.40 \\ \underline{32.23} \\ 4.17 \end{array}$$

$$\begin{array}{r} 628 \overline{) 398.0} \\ \underline{376.8} \\ 21.20 \end{array}$$

$$\begin{array}{r} 628 \overline{) 85.0} \\ \underline{62.8} \\ 22.20 \end{array}$$

$$\begin{array}{r} 628 \overline{) 145.0} \\ \underline{125.6} \\ 19.40 \\ \underline{18.84} \end{array}$$

$$\begin{array}{r} 628 \overline{) 230.0} \\ \underline{188.4} \\ 41.60 \end{array}$$

$$\begin{array}{r} 596 \overline{) 63.00} \\ \underline{59.6} \\ 3.400 \end{array}$$

$$\begin{array}{r} 596 \overline{) 517.0} \\ \underline{476.8} \\ 40.20 \\ \underline{35.76} \\ 4.44 \end{array}$$

$$\begin{array}{r} 596 \overline{) 16.00} \\ \underline{11.92} \\ 4.080 \end{array}$$

$$\begin{array}{r} 596 \overline{) 523.0} \\ \underline{476.8} \\ 46.20 \end{array}$$

$$\begin{array}{r} 179 \\ 36 \\ \hline 143 \end{array}$$

$$\begin{array}{r} 1627 \\ 11 \overline{) 179} \\ 11 \\ \hline 69 \\ 66 \\ \hline 30 \\ 22 \\ \hline 80 \end{array}$$

$$\begin{array}{r} 1627 \overline{) 143.00} \\ 14643 \end{array}$$

$$\begin{array}{r} 259 \\ 36 \\ \hline 223 \end{array}$$

$$\begin{array}{r} 9.59 \\ 27 \overline{) 2590} \\ 243 \\ \hline 160 \\ 135 \\ \hline 250 \\ 243 \\ \hline \end{array}$$

$$\begin{array}{r} 959 \overline{) 2230} \\ 1918 \\ \hline 3120 \\ 2877 \end{array}$$

$$\begin{array}{r} 163.3 \\ 628 \overline{) 398.0} \\ 3768 \\ \hline 2120 \\ 1884 \\ \hline 2360 \end{array}$$

	Rec.	ext Rec	
Condors	36	3	33
Eagles	20	20	238
Terns	456	23	271
	266		
	398	3	33
		20	266
		76	299
		109	109
			408
			264 3
			33 20
			299 76
			99
			299
			398

Rayfore

Pit	(2)	(3)	(4)	(9)	(13)	(16)	(10)	And, Total
Small	1	3	4	1	1	2	8	19
Cath.	5	41 ✓	61 ✓		18	25 ✓	3 ✓	201 ✓
Large	1	89	33		11	7	1 ✓	214
Cath.	1	7 ✓	3 ✓		1 ✓	1 ✓	5 ✓	22 ✓
	1	22 ✓	20 ✓		5 ✓	13 ✓	3 ✓	98 ✓
Hawks	1	1	1	1	1	2	1	1
	1	3	16	1	1	2	1	2
	1	31	8	1	1	17	1	4
	1	7	8			4	84	44
	2	19	1			17	45	64
		10	4			1	38	49
			2			2	4	46
						4	44	1
Eagles	1	9 ✓	4 ✓	2 ✓	4 ✓	27 ✓	2 ✓	46
	11	7 ✓	17 ✓	1 ✓	58	3 ✓	1 ✓	9
	2	8 ✓	5 ✓		3 ✓	382	1 ✓	6 ✓
		86	238		41	35 ✓	4 ✓	78 ✓
		11	30 ✓		2 ✓	66	3 ✓	24 ✓
		4 ✓	28			32 ✓	1 ✓	900
			20 ✓			36 ✓	3 ✓	97 ✓
Neop	6	18 ✓	40 ✓	10 ✓	15 ✓	144 ✓	2 ✓	1348
Poly	3	29 ✓	40 ✓	15 ✓			10 ✓	172
Falcons	1	2	2	2		3	9	71 ✓
		1	1	1		3	13	142 ✓
		2	8	4		3	3	272 ✓
		3				24	7	13
Owls	1	32	3	1	6	2	100	10
Large	1	6	21	1		59	6	8
Small	1	2 ✓	2 ✓	1	1	5 ✓	1 ✓	45
		1	3			5	104	72
		14	5			1	57	164
		27				15	592	13 ✓
				9	187	18	138	9
		496	628			957		3
		83				105		36
								71
								14
								1976

vvvv
III

13
272
142
71
97
24
78
6
98
22
1024

3/8

Species (by index)	1	2	3	4	5	6	7	8	9	(10)	13	14	(28)	36	(37)	51	60	61	67	P.D. -11017	77	81	83	Nov.	90	91	
<i>Ciconia maltha</i> ✓			2	8						12	2	10					2		1	2	2			3			29
<i>Arida herodias</i>			3							1		1					1	1	1	1				2			8
<i>Egretta thula</i> ?																								3			3
<i>Botaurus</i>			1							2				12				1		1		1		1			4
<i>Myadestes</i> ✓																								1			1
<i>Ojaya ajga</i>																											1
<i>Flonida caerulea</i> ?												1						1									2
<i>Mycticonax nycticonax</i>																			1								1
<i>Carmerodias egretta</i>													1						1								2
<i>Butorides viridescens</i>																		1									1
<i>Pligadis gratauna</i>																			1					1			1
<i>Quis canadensis</i>			2	6						5	6	6		1	2		2	2	1	1	2			4			30
<i>Quis americana</i>											1	1															2
<i>Fulica americana</i>				1																							1
<i>Parapavo</i> ✓ ^{ad}			¹⁴² 1	²¹⁷ 173		2			^{ad} 1	¹²⁷ 8	¹²⁷ 24	³⁴⁷ 238	^{ad} 1	⁵³⁷ 11			¹³⁷ 13	¹³⁷ 14	^{ad} 1	11	¹³⁷ 10		30		^{ad} 1	571	
<i>Roadrunner</i>			1	4								9		1		1								³² 2			16
<i>Penaidura</i>			5						1	1		17		2										3			25
<i>Columba</i>				1								1								1							1
<i>Phalacrocorax auritus</i>										1																	0
<i>Agelaius phoeniceus</i>	2	11	¹ 86	238					2	47	58	382	4	14			44	19	8	1	17	3		20	2		911
<i>Halioetus leucophthalmus</i>	1	2	11	28						3	41	66					6	2	2		3			11			171
<i>Lophortyx</i>				7						1		84		13				1				2		5			112
<i>Podilymbus</i>																											
Total			153	465						70	02	404	6	41	2		68	41	17	17	35	6		46			

Species	1	2	3	4	5	6	7	8	9	10	13	14	(28)	36	(37)	51	60	61	67	P.O.	77	81	83	Acad.	90	91	97	Total - P. 10
<i>Buteo borealis</i>		1	8	7					1	13	1	14	2	3	4	1	1	2	2	2	2	1		2				52
<i>Buteo regalis</i>		1	10	3						45	1	2	2	2	31	2	1	9	6		1	1	1	4				76
<i>Buteo swainsoni</i> ?		1	19	1						38		1	4	8	42	1?		7	5	1	1	3		2				95
<i>Buteo lagopus</i>										4			1?											1				2
<i>Buteo? sp.?</i>				2							1	4					1				1							10
<i>Polyborus</i> ✓	1	3	29	40		1				1	15	14	3	6	1		8	5	3	5	2	1		12	1	1		269
<i>Falco mexicanus</i>			2	2						9	2	3	1				1	1						2				12
" <i>peagius</i>			1							13	1	3	1		1			1	2			1		2				11
" <i>columbarius</i>			2	1						2	1	3	1				1											9
" <i>sparverius</i>			3	8						7	4	24	1	2	2						1	1		3				6
<i>Xestobrychis</i>											2																	1
<i>Elanus leucurus</i>			1							1				1														2
<i>Accipiter velox</i>			1	1						1		2																4
" <i>cooperi</i>			3	13					1	1		12					2			2				3				33
<i>Circus hudsonius</i>		1	31	8						84		4	6	12	21		1	2	1	1		6		3				93
<i>Cathartes aura</i>		1	3	4						8	1	2	1	3	5	1	1	1		1	1	1	1	1				27
<i>Bryopsis occidentalis</i> ✓		5	41	61					1	3	18	25		1			9	8	8	2	14			8		1	1	196
<i>Vultur calurus</i> ✓	1	1	7	3							1	1						3	3		2			1				22
<i>Gymnogyps</i>	1	1	89	33						1	11	4		3			7	22	18	2	18			6				214
<i>Ternis</i> ✓	1	1	22	20						5	5	13	1?	1			7	11	11		4			3				100
<i>Morphnus woodhousei</i>			7	5						11		3					2	5	1					1				24
<i>Urocyon</i> ✓				4																				2				6
<i>Urocyon</i>		1	9	17						3	4	27		5			4	2	4		2			3				27
<i>Spizella</i>			8	30						4	3	15					4	3	1	3	3	1		7				98
<i>Neogys</i>			4	20					1	1	2	32					5	1	1	1	1	1		3				72
<i>Neomonticola</i>	6	18	40							3	19	34		2			5	6	3	3	3	1		10	7			130

$$\begin{array}{r} 117 \\ 45 \\ \hline 2 \end{array}$$

$$\begin{array}{r} 63 \\ 13 \\ \hline 76 \end{array}$$

$$\begin{array}{r} 152 \\ 57 \\ \hline 95 \end{array}$$

$$\begin{array}{r} 132 \\ 36 \\ \hline 94 \end{array}$$

$$\begin{array}{r} 178 \\ 84 \\ \hline 94 \end{array}$$

$$\begin{array}{r} 934 \\ 47 \\ \hline 889 \end{array}$$

2
89
33
11
14
35
22
28
18
28
210

Species	1	2	3	4	5	6	7	8	9	10	13	16	(28)	36	(37)	51	60	61	67	P.D	77	81	Acc	90	91	Total
Tyto alba	1	1	32	3					1	99		2	22	9	14			12	4			4	8			113
Bubo virginianus		1	6	21					1	4	6	59	1	2			8	1	2			1	1	6		45
Otus asio			1									5	(2)	2	1							1	1			109
Spermops			14	3						104		15	56	1	31									3		123
Strix brea			2	2								5		1				1			1	1				14
Glaucidium gnomat			1									3		1												17
Cyptoglaux acadia														1												1
Asio 2 yrs			27	5					1	57	1	18	21	6	4		1	1	2	1			7	9		90
Asio 2 yrs			3	2						264		104	100	23	49		8	14	7			14	28			
Grand Totals			566	849					594			1395	133	129												
Source			R(2)	8(2)	22(6)				3(2)	22(6)	11(2)	7(2)														
Reck			4(3)	4(2)	4(2)				2(2)	31(6)	2(2)	4(3)														
x = yearling																										
Neophila			16.2	3.5	6.4				0	0.53	4.8	3.1	0	2.3	0		4.2	4.2	3.5			3.5	0	7.6		
Terry			12.5	2.7	4.9	3.2			0	0.89	2.7	1.3	1.8	1.1	0		4.2	8.8	12.7			4.6	0	2.2		
Agula			25.0	29.7	18.5	38.0			22.2	8.3	31.3	40.6	3.1	16.2	0		31.6	15.2	9.3			19.7	1.9	13.1		
Haliaeetus			12.5	5.4	2.7	5.8			0	0.53	22.1	6.9	0	0	0		5.1	1.4	2.3			3.5	0	8.3		
Gymnogyps			12.5	2.7	19.4	5.3			0	0.17	5.9	0.42	0	3.5	0		5.9	11.5	20.8			20.8		4.5		
B. borealis			0	0	1.7	1.1			11.1	2.3	0.5	1.3	1.5	3.5	2.4		0.85	1.6	2.3			2.3		1.5		
B. regalis			0	0	2.1	0.48			8.0	0.5	0.2	1.5	2.3	19.5			0.55	7.2	6.9			0		3.2		

Orders of birds for chart of Pit 10

	Individuals	per cent of total
Pelecaniformes	1	0.1%
Ciconiiformes	4	0.5%
Anseriformes	5	0.6%
Falconiformes	329	43.9%
Galliformes	11	1.4%
Gruiformes	5	0.6%
Charadriiformes	6	0.8%
Columbiformes	1	0.1%
Strigiformes	267	36.0%
Passeriformes	120	16.0%
Total	749	

omit numbers on chart

Ex

Comparison of number of individuals of extinct species and ^{Recent} existing species as represented in ~~Pit 10 and Pleistocene pits 3 and 4~~ ~~La Brea pit 10 and Pleistocene pits 3 and 4~~ ~~Rancho~~

Pit 10
Extinct 31
Recent 587

Pit 3
Extinct 185
Recent 346

Pit 4
Extinct 425
Recent 432

Comparison of number of individuals of Condors and eagles vs. hawks, owls and falcons, as represented in ~~Rancho~~ pit 10 and Pleistocene pits 3 and 4.

Pit 10
Condors and Eagles 63
Hawks, Owls and Falcons 517

Pit 3
Condors and Eagles 239
Hawks, Owls and Falcons 134

Pit 4
Condors and Eagles 398
Hawks, Owls and Falcons 85

including Caracaras, Catbirds, Corvids & Neophelobates
Jan. 14, 1911 for check with Ida de May

63
523

239
220

398
230

These forms not considered
in original charts as of intermediate
size - neither small nor large

Fig. 1 Chart showing number of individuals of extinct species compared with ~~individuals of~~ ^{still existing} species, in Pleistocene pits 3 and 4 compared with pit 10.

Fig. 1 Chart comparing number of individuals of extinct species with those of still existing species as represented in Pit 10 and Pleistocene pits 3 and 4.

Pit 10 extinct 31

Recent 587

Pit 3 extinct 185

Recent 346

Pit 4 extinct 425

Recent 432

Comparison of number of individuals of extinct species and existing species as represented in Pit 10 & Pleistocene pits 3 & 4.

Comparison of number of individuals of Condors & Eagles vs. Hawks, Owls & Falcons as represented in Pit 10 & Pleistocene pits 3 & 4.

	Pit 10	3	4
Cond.	63	239	398
Hawks	517	134	85

We have ^{already} observed that ^{extinct} nine species ^{of} are
represented in P.T. 10. Though this no, is ^{highlighted}
^{one} half the n of the extinct species recorded
from Pleistocene ^{Paras. La Brea} it ^{approaches} ~~lacks~~ but
Dance of equality the representation of one
^{single} of the Pleist. pits.
nearly one extinct representation ^{of any} of the Pleist.
pits taken separately.

Comparison ^{made} of ¹ individuals of large & small
raptores of abundance of ~~individuals~~

Large & small raptores ~~large~~ as represented
in P.T. 10 & Pleist. pit 3 & 4. The large forms
include ~~individuals~~ ^{Teratomis,} Condors & Eagles. One small
Hawks, falcons & owls. Raptores of medium size,
such as ~~the~~ Coragyps, Cathartes, Neophelopsis & Pelybicus are
not included.

Phalacrocorax auritus
 Ardea herodias
 Botaurus lentiginosus
 Goose
 Teal
 Teratornis merriami
 Gymnogyps californianus
 Coragyps occidentalis
 Cathartes aura
 Elanus leucurus
 Accipiter cooperi
 Accipiter velox
 Circus hudsonius
 Buteo borealis
 Buteo swainsoni
 Buteo regalis
 Buteo lagopus
 Buteo borealis or regalis
 Aquila chrysaetos
 Haliaeetus leucosephalus
 Spizaetus grinnelli
 Urubitinga fragilis
 Neophrontops americanus
 Polyborus cheriway
 Falco mexicanus
 Falco peregrinus
 Falco sparverius
 Falco columbarius $\frac{1}{2}$
 Parapavo californianus
 Lophortyx californica
 Grus canadensis
 Squatarola squatarola
 Oxyechus vociferus
 Sandpiper, sp.?
 Larus, sp.?
 Zenaidura macroura
~~Bubo virginianus~~
 Tyto alba
 Bubo virginianus
 Speotyto cunicularia
 Asio wilsonianus and
 flammeus
 Passerines, estimated

1	1	0.14	0.50
1	3	0.43	1.50
2	4	0.57	2.0
3			
1			
5			
1	14		
1			
7			
1			
1			
1	211.30.370		
178			
43			
322	303	43.6	1560
44			
4			
7			
39	49.7596		
3			
4			
1			
2			
1			
8	29.770		
10			
7			
3			
6	7	1.0	3.6
1		0.57	2.0
4	7	0.86	3.0
1			
1	6		
1			
1		0.14	0.50
1	1		
92			
6			
98	25.2	36.6	1320
56			
114	11.4	16.4	590

695

Numerius americanus

Sinus fedora?

695

Per 10

267
71
338

C O P Y

1333 Burlingtonboe
Los Angeles, California
May 22, 1914

My dear Dr. Merriam:

Reply to your's of the 18th, is a little delayed on a/c of having to look up several points from data kept at the ranch. Will answer your questions in the order given.

The connection of the "north vent" was, as you correctly remember, about a foot in height and the same in width, arched above, flat at the base. The south vent tapered to 5' below datum, where it was 8" in diameter which dimension was continued to it's connection with reservoir. If your artist will swing base of this funnel to the left and connect with reservoir at the point marked with cross in diagram, the same will be correct. These inaccuracies are no doubt due to my lack of skill as a draftsman, my education in this line having been very sadly neglected.

As to the numbers and letters designating squares in the horizontal projection: Letters and numerals designate lines and the square above. For instance, F-9 indicates the square between F and G, and between 9 and 10. I often find occasion to locate a bone or skull more definitely than can be done by referring it to some square, thus: "intersection of F-9", that is, lying on point where these lines cross; or, "in F on 10"--that is, lying on line 10, in section between lines F and G. Hence, as the dog is 2 years old until it is 3, so the numerals and letters cover spaces next higher than the lines on which these numerals and letters appear.

Mr. Fischer will confirm my statement that no tiger bones were found in pit number ten. I saw the bones taken out, and he sorted them before cleaning; and there were no tiger bones either when removed from the pit or when sorted. They must have been introduced in some manner during the cleaning process. You doubtless know about how much interest the average unscientific worker takes in his work and how little such help can be trusted for absolute accuracy.

As to the Teratorn's bones: The first coracoid taken was at 3'9", just at top of the hardened asphaltum. Cannot state depth of the other, but as I recall it now, it was less than 6" below the first and was in the hardened material. I think my notes cover this point, also the extent of the hard asphaltum, which was from around 4 ft. to around 5 and 1/2'. Below 5 and 1/2' the matrix was of small irregular lumps, embedded in tar-soaked sand.

With the explanation I have given of my method of lettering and numbering, you may have wondered at the status of F-11. F-11 existed at 3 ft., but pinched out at 4 by the southward shifting of the deposit. An unpardonable discrepancy between lettering of the pit walls and my office chart is cause of this. I detected it long ago and thought I had made all corrections, (see notes) but this box got away before I had opportunity to change the tag to F-10, which it should be.

Of course we are anxiously awaiting your report on the "little fellow", and very regretful that the tiger material did not occur in that pit. Should we be so fortunate as to unearth another of the genus homo, you may rest assured that there will be no mixing of material anywhere along the line.

Wish you could see the mass of big eleph. bones we are exposing in an "extension" to the south end of the elephant pit. There are six femurs, a tibia and some other bones, also a bear skull, — all within a space of 6 square feet and between 10 and 1/2 and 12' below datum. Skulls were lower, you remember. They must have gone in head first, hey?

With kindest regards, I remain,

Sincerely

s/L. E. WYMAN

Sunday, June 5
M VZ

Dear Hildegard:

I leave Tues. a.m. for the field and am trying to round up the Pit 10 work today so will write long-hand. Of the various things that remained to be done, I can report as follows:

Mrs. Kinney has made an extended search for notes and correspondence of Merriam's in the period of interest in Pit 10. She and Dr. Camp went through a lot of stuff in the campanile and Dr. Clark tried to find the material — all to no avail. They have all been very helpful and I believe have exhausted all possibilities.

Sturton and I looked for La Brea material of 1912 associated with arrowhead — again no luck. There are no early catalogues and no suggestion of arrowhead association on labels. All the La Brea material except some screenings ^{is} pretty well pooled together. There are some locality numbers, but all seemingly from the typical Pleistocene (such as 2057, etc.)

The passerines from the chimneys & sump (nos. 3530-4300) have all been gone over. My work sheets of identifications are enclosed in case you might need them. It is my ~~own~~ only copy.

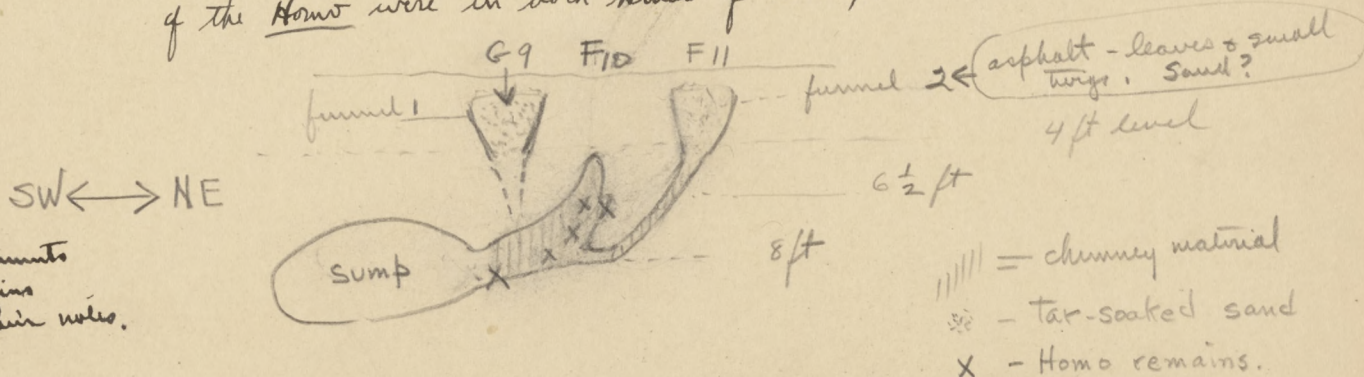
I have been able to add two species to the list from the initial cut (see MS, p. 3). Neither Corvus caurinus nor Pica appear in the chimney & sump collection but they form such a small proportion of passerines that this is not surprising. They are of course "locally extinct" and tend to off-set the tendency to more extinct types in the chimneys which you find. I have ~~not~~ been able to add more passerines to the general Pit 10 list. Of course I feel that there is a chance that a few poorly represented things may turn up when all elements are exhaustively studied, but they surely will not change the general picture. On the whole the Pit 10 material is certainly lacking in variety in the passerines, compared with the Pleistocene.

Note that a Speotyto mandible and Falco sparverius ulna were included in the chimney material that I have here. You can adjust the totals as may be necessary. My totals for the sumps & both chimneys are based on the most numerous identifiable element (humerus, for all but C. corax & C. brachyrhynchus.) There is no question that 1 crow humerus represents the small crow (caurinus). It is well below all modern skeletons of C. brachyrhynchus, and we have over 50 modern skeletons. The Pica is also certain — no question as to number of bones and you have checked the pit in the catalogue. There are of course hundreds of Pica in the Pleistocene.

I thought that it might be well for the sake of persons not familiar with *La Brea arifanna* to mark in some way the extinct species - say italicize their names, and not those of the others.

The notes of Wyman's have proved very interesting. I have gone over them with the pictures many times and have plotted the sections & placements of deposits according to your maps. One thing bothers me. The first funnel centered on line ~~the~~ G+9 and was only 3 ft wide ^{at base} (along SE wall). It could not have extended into F10 but only half way thru F9, even at top. But the dike crowds in from NE in F10 ^{or 11} and ~~not~~ ^{not} ~~could~~ ^{was} ~~Homo~~ was in F10. Hence it is not clear that the funnel actually connected with the dike or chimney and if it did it could have connected only in F9 or F8. I think surely there must have been some connection but it would not be correct to say that ^{the} chimney passed through the first matrix. It may have passed along, essentially beneath it, ~~to~~ slanting upward to the northeast. I find no clear indication of just where the ^{first} funnel of ~~tar & sand~~ tar-soaked sand pinched out. On Feb. 4, he says it was pinching out. They were then down at least 4 feet and presumably some farther (but chimney off to NE in F10), but were they down 6 or 7 feet? The vertebra and lower jaw of *Homo* were in tar and sand matrix at 6'9" but in ~~F10~~ F10 hence not in original tar-soaked sand funnel which was farther SW. There must have been another mass of such matrix at this point. ~~which shows that there~~ was no fundamental difference between hard asphalt of chimney and tar-soaked sand in point of time, therefore, because parts of the *Homo* were in both kinds of matrix.

See ^{my} comments on margins of Wyman's notes.



It seems to me that the material is all about of the same date. In the list, however, if we make ~~any~~ ^a separate column for those of known location, I favor leaving out chimney 2. It seems rather separate - no bones below ~~2~~ 5 1/2 feet. It may have been formed much as was first funnel.

Merriam certainly seems to have been wrong as to his directions on the two chimneys. However, if the two upper funnels were what

he was thinking of, the Howe was rather between them and might be thought of as in the base of the one to the north or rather in the connection running to the north funnel. This is of course not strictly true but may explain the statements he made.

I have not had time to start anew on a version of the ms but have suggested several changes in yours. The first thing is to find out if you think my points are ~~are~~ justified. If we are more or less on common ground I would say go ahead with final ms. I feel my part ~~has~~ been rather insignificant in this combined effort and I wish I had time to do some of the work on polishing. But I know you are anxious for ~~this~~ a report. If there is anything to be done ~~by~~ after the middle of July when I return I will be glad to "pitch in".

Sincerely

Alden H. Miller

L.A. Museum
March 3, 1937

Dear Alden:

Dr. Stock wants a short statement from us on the Pit 10 birds to send, with his statement on the mammals to Merriam. Merriam will probably read it at the Philadelphia symposium on early man. It has to be sent pronto, therefore the air mail. Please send your answer in similar fashion--- stamped envelope enclosed.

I have knocked together a brief bit on the basis of my findings, and will you please insert a paragraph on the important points revealed by the passerines-- climatic change shown, or whatever is the significant contribution of the passerines.

Then please read over the whole thing and make any changes you think necessary. Particularly, am I right that there are relatively more passerines (individuals) in Pit 10 than the Pleistocene pits? That, of course, you will have to calculate on the basis of your and my figures. Also, you will note I have left blank some per cents on abundance of extinct birds where I will need your totals to add to mine.

Following are the total numbers of individuals and species from my study, for pits 10, 16 and 4. I think for this paper we need only compare with these two typical pits. It is best to omit some of the others until we are sure of the age.

	Individuals	species	extinct indivs.	extinct sps.
Pit 10	599	46	30	10
Pit 16	1448	67	572	13
Pit 4	875	47	424	14

Will you please give me your count for these same headings?

Sincerely,

Heidegarde Howard

Picidae + Passeriformes
2 identifiable individuals only

	Individuals	species	extinct indivs.	ext. sp.	indiv. living species now about locally	living species now about locally
Pit 10	95	5	0	0	0	0
Pit 16	163	16	1	1	99	5
Pit 4	20	6	0	0	11	2

In the passerine group there are but two extinct species, neither of which occur^{ed} in Pit 10. The principal changes in the small-bird fauna have to do with the local extinction of species that have persisted in other regions. Several of the ~~abundant~~ ^{birds which were abundant in the Pleistocene assemblage} species which have disappeared ~~are~~ ^{but} in this local fauna of the [✓] ~~are~~ ^{in the fauna of the [^]loc. today} which ~~are~~ ^{but} absent in Pit 10 are important as indicators of biotic and climatic conditions. The changes in environment which are indicated, bespeak a considerable lapse of time.

Thirty per cent of the species of small birds of the Pleistocene, now are locally extinct. There are no species from Pit 10 which ~~are~~ ^{and} have not occur^{ed} at Rancho La Brea in historic times. The change in environment consisted of a retreat of the live-oak and brush-land associations.

Or? (Probably the rainfall was greater, but there was an arid summer period, perhaps even more extreme than at present. In Pit 10 there is an increase in grassland types. In one instance, that of the Western Meadowlark, there was an increase, relative to the total number of passerine individuals, from 12 per cent in the Pleistocene to 69 percent in Pit 10.

[Hope this will do. after as you see fit.

Excerpts from correspondence between Merriam and Daggett in 1914.

Merriam - Feb. 14 says "I had a very good opportunity to go over the occurrence of the human remains with Mr. Wyman yesterday afternoon." Speaks of making train from Los Angeles that evening (so must actually have been in L.A.). Speaks of coming down again on Feb. 23.

Daggett - Feb. 17 says that pit 10 is to be covered temporarily and left status quo.

Daggett - Feb. 21 speaks of floods in L.A. and protection of pit 10 by cover.

Daggett - March 18 "Pit 10 has been cut down to clay on the bottom. The shelf on the north was also cut down to clay. It contained the vent of what you called the "dyke". Many bird bones were found including 2 coracoids of the teratornis and fragments of mammal skeletons. Near the surface there were some bones of horse and bison altho there is a suggestion that these may be modern additions. The sump in the lower so. west corner has been followed down and the tar contains many bird and small mammal bones and some vertebrae of that young bear found higher up. No more human bones found unless Fischer on closer investigation finds something small."

Merriam - April 14 expects to spend couple of days taking final look at Pit 10 and review entire collection obtained in association with human remains. "I would like then to go over with Mr. Wyman all of his notes and to look over photos and sketches.

Merriam - April 17 planning to be down the next Tuesday to go to LaBrea. Other letters ~~xxxx~~ the last of april and through May not so important. ~~Daggett~~

Daggett - May 1 Fischer restoring lower jaw with instructions to restore in white so apparent and not to restore missing parts or outlines (human)

Merriam - May 2 suggest final restoration of human skull should "sass put in zygomatic arch and fill out breaks in skull especially in frontal region. Mentions artist making sketches showing bones in place.

Merriam - May 5 Mentions avoiding shininess of asphalt bones in photographing by softening light by having it pass through tissue paper before falling on specimens. Speaks of drawings showing chimneys giving effect of "hanging in the air". Miller's list of birds arrives.

Daggett May 12 speaks of sending small box containing mammal and bird bones from brea in cranium of Homo. No. of bird bones from this sent to Miller (May 11 note to Miller sending them, tells Miller to notify Merriam of identification of bones).

Merriam - May 18 Says writing to Wyman that day about pit 10 about associated fauna. Has turned over bones from inside cranium to Stock, for identification. Merriam going to Seattle and leaving all notes on Pit 10 in drawer of filing case in University Library.

Daggett - May 26 refers to possible trouble (or criticism from Larkin or Gilbert when paper presented.

Merriam June 3 speaks of giving report to Science which will be only a preliminary report. Says "Following this statement I shall go over the ms. ~~xxxxxxxxxx~~ of my article carefully a number of times before turning it over for printing."

Merriam June 13 refers to Teratornis from north chimney. Had made certain of Miller's determination of Teratornis humerus found near skull

and one of coracoids found in vicinity of 4' in depth. Did Miller pass on both coracoids from near depth of 4' as being Terry? If not Merriam would like to have whichever specimen is not certainly identified. (Daggett's pencilled note on margin says "1 coracoid Teratornis F10, 2½ - 4'") Merriam continues "am having Wyman's original notes typed and shall return original copy to you next week by registered mail. I shall also return his original drawings."

Daggett, June 18 says regarding 2 coracoids of Teratornis found near 4' level in Pit 10. "Am sending the one marked on box as F10 2½ - 4' This lot has one of Dr. Miller's small white cards placed among the lot of bird bones but the card is blank. As this lot is the original box with card on end of it, he may have considered further marking unnecessary. The card being used when sorting made it necessary to start a new box."

Merriam June 22 received Teratornis coracoid and returned it (Daggett's marginal note says "received June 24, 1914") Merriam continues "Wyman's original sketches are not photographed yet and I put them in fire proof storage."

Merriam July 25, 1914. Refers to having heard of an article in So. Calif. Acad. Bull. for July on Racno La Brea skeleton. Says Science article in proof.

June 1, 1914 - Merriam "I am having slides made here from the photographs of bones in place of our maps of the pit."

Nov. 29, 1916 - Merriam mentions the photos he wants taken of human skull.

March 10, 1919 - Merriam plans to return to Washington

for a time. T says

"I have just been assembling all the materials here on the problem of the human remains from RLB, & I shall make this a specific study while I am in Washington."

It may be necessary to write you regarding certain details of in the final paper I come across points that are not covered by any notes here.

May 14 letter from Merriam (1914?) says he is forwarding drawings to Wyman for suggestions on this day.

To Dr. Stock, from J.C. Merriam
11-11-43

ORIGINAL NOTES ON PIT 10, RANCHO LA BREA EXCAVATION
OF MUSEUM OF HISTORY, SCIENCE AND ART
LOS ANGELES. By L. E. Wyman.

1914

Jan. 29.

Began work with dynamite to remove heavy deposit of hardened asphaltum, about 3' above land surface adjoining on the S. W. Made cut 3 and 1/2 ' wide, N. E. and S. W. Found soft material 1' under crest of outcrop. Established datum at 15" under crest. Many bird and small mammal bones just under datum in matrix of tar-soaked sand, but containing much water, and the bones mostly too soft to be saved.

" 30.

Great quantities of bones of bird, fox and coyote from 2' to 3'. Matrix unchanged in character. Covers only a small space not more than 3' along S. E. wall, which apparently cuts through it. Stub of deer antler, also fragment of skull, found at 2 and 1/2 '.

" 31.

Character of matrix and bones unchanged, except traces of bear.

Feb. 2.

Bear skull and several leg bones at 4'; also vertebra and bones of cub bear, many coyote and one badger skull. Deposit shows V-shaped where S. E. wall cuts it.

3.

Cutting 6' square on S. E. side of initial cut to cover remainder of deposit shown in wall and explore ground in that direction.

- Feb. 4. Extension shows deposit funnel-shaped and cut nearly in half by S. E. wall of initial trench. Funnel contained the usual bird and small mammals, with considerable bear, including fragments of cub skull and one wolf at 3'. Elsewhere extension is absolutely barren in bluish clay. Abandoning No. 1/2 of this at 4', and carrying down So. 1/2 to floor of initial cut. Funnel nearly "pinched out." "Dike" or "chimney" of partly hardened asphaltum 12" wide, crowding in, in original cut, along line of S. E. wall, from N. E. pit sectionized, N. W. wall on line "F", lines 6 and 9 crossing near center of "funnel" surface at datum.
- Feb. 5. Right upper jaw of homo at 6 and 1/2' in burned (?) asphaltum of dike, scapula slightly lower, and toward face of N. E. wall, both in Section F-10.
- Feb. 6. Photo No. 36. "Dike" or "chimney".
- " 7. Vertebra and lower jaw found at 6'9" in tar and sand matrix, also ulna and radius. Femur exposed in F-10.
- " 9. Cranium, femur, humerus, ulna and vertebra removed at 7 to 8 feet. Humerus of *Teratornis* 4" below and 10" to east of cranium. Tar seepage heavy into S. W. part of cut. Apparently a reservoir to west of cut in F-8 and 7 or under N. W. wall of these sections, has been tapped. Six pails of tar removed this morning from "sump" in F-8.
10. Extending cut S. W. through F-8 and 7 and down to level of floor in F-10. Homo femur in sight, beside bear rib, at 7' 10", in F-10.

- Feb. 11. Cut in F-8 and 7 down to 7 and 1/2 ft., through the clay and into a tar quicksand, barren of bones. Removing muck pile with team and scraper.
12. Left upper jaw removed at 8 and 1/2'. Femur exposed for photo.
13. Three photos (Nos. 46-47-48). Femur removed. Mass of large bird bones, and two vertebrae of cub bear, removed. Chimney reaching across F-10 and 9 into F-8, to tar "sump". Cervical vertebra of bear in edge of "sump" at 8'9", also phalanx near "sump". No homo.
14. Atlas of homo in edge of sump at 8' 10" also bear phalanx. Exposure of clay walls turning them from a bluish-green color to a dirty tan, and cooking out oil contained therein, so that checks in these walls are black and gummy with asphaltum.
16. Right frontal bone found at 8'8". Suspending work for the present. Two photos (Nos. 49 and 50.)
18. 18" of water in F 9 and 10, from heavy rain. Bailed out.
19. 3 ft. of water. Bailed out.
20. 2 ft. of water. Bailed again. Walls dry above water level, protected by canvas from rain.
21. Pumped out 2 feet of water.
22. Pumped twice. Seeping heavily from near surface in H and I., 9, also in F-11, likewise near surface.
23. Pumped in morning. Bailed dry in P. M.
24. Bailed again. Only a few inches of water. Miller working dump, with instructions to save every fragment of bone.

- Feb. 25. Bailed in morning. Tar cleaned out in P. M. Canvas removed to allow pit to dry. Constant small seepage at 2 and 1/2' in F-11, - (from direction of old Univ. pit), also from S. E. extension (H and I-9).
27. Considerable cave-in on N. W. wall just over tar quicksand, in E-8 and 7, exposing large mass of the sand underneath the wall. Wall braced to prevent further damage. Removed part of caved material and cleaned pit.
28. Bailed out 5" of water. Miller finding bear phalanges in dump, also fragments of upper and lower jaws of little antelope.
- March 2 Bear dorsal in dump.
- 6 Marking again. Marked bottom down 6". Found 2 bear vertebrae and quantity of bird and small mammals, mostly too soft to save.
- 7 No digging. Miller working on dump again.
- 9 Don to 10 and 1/2' in F-8 (in "sump"). Much bird, fox, coyote, badger, and several bear phalanges and one below.
- 10 Area of deposit in F-8 contracting, but still packed with the usual sort of small bones, exception to which was bear humerus. F-9 and 10 cut down to 10 and 1/2', mostly in a dark friable clay, absolutely barren. In working through F-10 from F-9, deposit of asphaltum flattens out just under 9', nearly reaching wall, on line F, and plays out entirely at 9 and 1/2'. Below, oil-soaked gummy clay, and still lower the darker, more friable earth mentioned above, all barren from 9'3".

March 11

Cutting down F-11 and N. E. 1/2 of F-10. (This portion previously cut down to 2 and 1/2'). Asphaltum deposit here also proving funnel-shaped, nearly round at 3', lying nearly all in F and bisected by line 11. Masses of leaves and small twigs at 3 and 1/2' and down. Few bones. Carocoid of Teratornis at 3 and 3/4. (Photo 66). At 4' another coracoid, also bones of young horse, down to 5' 6". (Photo 68). Area of deposit pinching in rapidly, only about 1/2 as large at 4' as at 3'.

- 12 Great quantities of leaves and twigs, particularly in northwest half of funnel, while opposite half is mostly of hardened barren asphaltum. Deposit narrowed down to "pipe" about 12' in diameter, slanting S. W., and worked out entirely, at about 8', into original cut, (where homo bones were found). Nothing found below 5 and 1/2'. Reopened work in "Sump" (F 8) and
- 13 sank to 12'. Got two vertebrae of cub, and more of the usual bird and small mammal material, also wolf-tooth.
- 14 Down to 12 and 1/2' in "sump". Some small bones of bear and the usual small mammal and bird.
16. "Sump" nearly exhausted; at 12'9" tar-soaked clay, barren of bones. "Burrowing" N. W. under wall, into E-8 as deposit extends in that direction - and contains same character of bone material as in F-8. This section being so far to N. W. of funnel which supplied "sump", suggests that possibly it may have received bones from still another vent, at present unlocated, and more directly above it, than funnel centering on crossing of lines G and 9, and which evidently

March 16 supplied "sump" in F-8.

17 Character of bones and matrix same as in F. Considerable bear material. Deposit appears to extend not more than 2 and 1/2' under wall, and about the same in width, confined to section E-8.

18 Proportion of bear material increasing. Now down to 13' and deposit rich as ever.

20 Deposit exhausted at 13 and 1/2'. Digging suspended.

23 Photo of "reservoir". (No. 71). Survey of this reservoir shows the following: Tapped at 7' below datum. 7" wide (N. W. to S. E.) at 8' depth, on line 8. Extends at least to line 6. Known depth, 6 and 1/2'. Roof arched, of solid, tough clay. Contents of reservoir, tar-soaked sand, very gummy, and as far as explored, barren of foreign material, except that portion lying under, or adjacent to, funnel-shaped vent and "dike"; this portion only was filled with bones.

25 Dr. Merriam visited pit today. Photo of N. W. wall in F-10 and 11, near surface (No. 82) also projecting corner of S. E. and N. E. walls, in G-10 (no. 81). All weak spots timbered.

26 Inspection N. W. wall in F 10-11 shows the following: At the surface a cap of rock-like asphaltic formation, 9" to 18" in thickness, extending downward to datum on line 10 (At this point datum is 15" below surface), where numerous lumps of a brownish substance, very light in weight (Oxidized asphaltum)? intrude. Below, at 1', under datum, a sandy, tarry matrix, this followed by a heavy gummy clay, bluish green when freshly cut, but soon changing with exposure to a light tan color and the seams blackening with oil. At six feet a thin stratum of flour-

March 26 like sand, about 3" thick, then clay again, but harder and with occasional very small pebbles, this giving way at 9' and below to still harder, but friable dark material.

 In face of cut (N. E.) in F-10, at 6', in contact of "dike" with clay, was a lump of oil-soaked clay, size and shape of a hen's egg. Occasional pebbles and small gravel, rounded and smoothed, around 8'6" to 9'.

 In S. E. face in G-10, at eight feet sand stratum shows, with some small gravel from 8 and 3/4' to nine and one-fourth'; underneath the same dark, friable earth as encountered in opposite wall.

Note. Datum established for Pit No. 10 is 164.7 feet above sea level.

How about a title with "Pit 10" in it
associated with human remains in the
The Avifauna of Pit 10, Rancho La Brea
Howard + Miller
3 pages + list
#1 To Allen
KEEP

In August, 1914, Dr. J. C. Merriam (Science, n.s. vol. XL, pp. 198-203) published a report on the discovery of human remains at Rancho La Brea in the Los Angeles Museum pit number 10. All subsequent references to the subject have been based upon this early report and no further study has been made of the associated bones of birds or mammals. With the more recent discoveries of man in various other deposits of Quaternary age, interest in Rancho La Brea Pit 10 has been revived. IN the hope of possibly throwing more light on the age of this deposit, we have made a careful study of all bird remains taken therefrom. These include additional specimens to those originally examined by Dr. Loye Miller at the time of ~~Dr.~~ Merriam's report. Furthermore, in the light of intervening studies of the extinct species from the typical Pleistocene pits at Rancho La Brea, specimens which previously passed unnoticed are now recognizable and thus the list of extinct birds represented in pit 10 is increased ~~from the single Teratornis as first reported, to ten.~~

A brief review of the nature of the pit 10 deposit should be here indicated. The following account is based upon the field notes of L.E. Wyman, in charge of the Los Angeles Museum excavations.

and The original cut, $3\frac{1}{2}$ feet in width, revealed a matrix of tar-soaked sand containing quantities of bones of birds and small mammals. This deposit ~~proved~~ *turned this* to be funnel-shaped, *Excavating through cut* "pinching out" *to have been "nearly pinched out"* at about ~~seven~~ *four?* feet. However, at a depth of approximately four feet, a narrow "chimney" of asphalt, containing lumps of hardened asphaltum, was encountered ~~passing through~~ *at* the first matrix. This chimney widened gradually and tar seepage became noticeable, until at a depth of about eight feet it was found to connect with a tar "sump". In the chimney and at the edge of the sump, at depths from $6\frac{1}{2}$ to 8'10", were found bones of the human skeleton, presumably all of one individual. A second chimney, similar to and connecting with the first just above the sump was also encountered. *extending beneath the first matrix*

Considering the difference between the matrix of the chimneys and of the funnel of ~~surrounding~~ material in the first cut, it was thought possible that the bones in the two matrices were not contemporaneously entrapped (Merriam, op. cit., p. 201). The theory was advanced that this first matrix may represent a relatively earlier deposit through which tar from the sump beneath has later oozed to form chimneys in which were entrapped more recent forms. In our present study, therefore, it is necessary to consider the possibility of this difference in age of material.

Unfortunately only one-tenth of the bird specimens are now accompanied by data as to their former location in the pit. Of the original seven or more boxes of bones taken from Pit 10, the contents of only about half still bear the data as to section. These were boxes (containing the mammal collection and but a few birds) which were sent to Dr. Merriam for study in 1914 and were kept in tact through the years. The contents of the other boxes (including the greater part of the bird collection) were catalogued as of Pit 10 without further data as to section.

There are, therefore, only 797 out of the total of seven thousand bird bones taken from Pit 10 for which data are available. Seven of these were ^{near the label} ~~taken in the initial cut~~, and likely represent the ^{2-7'} ~~outer~~ ^{matrix material} ~~matrix material~~; fifty-eight are from the ^{second chimney} ~~second chimney~~ at ^{depths vary-} ~~depths vary-~~ ing from $2\frac{1}{2}$ to $5\frac{1}{2}$ feet, and the remainder were taken below eight feet down, in the chimney with the human remains, or in the adjacent underlying sump.

In the following list of species from Pit 10, those starred are represented by specimens from the ^{first or main} ~~two chimneys~~ ^(Homo deposit) and the sump. The number beside the star indicates the number of individuals represented from this section. The number in the farther column indicates the total number of individuals of each species calculated for the complete Pit 10 collection.

From these starred specimens it may be noted that the extinct forms

present in the ^{main} chimneys and adjacent sump are found in as great proportionate abundance as they are in the combined collection from Pit 10. Actually the abundance is slightly greater, but we must allow here for the scarcity of specimens for which data are available as well as for the fact that this collection comprises relatively few bones of the smaller birds, practically all of which would be of Recent species.

The seven bones from the original cut, ^{layers 2-7} represent Recent species (*Cathartes aura*, *Buteo swainsoni*, *Buteo borealis*, *Aquila chrysaetos*, *Corvus corax* ^{and} *Sturnella neglecta*). These, of course, are not indicative of the complete series from this section so that ~~no comparisons are possible with chimney material on the basis of these bones.~~

Referring again to Mr. Wyman's field notes which record from the original cut ~~in the matrix surrounding the chimney~~, masses of bones of birds and small mammals but no typical large Pleistocene mammals, it is evident that this fauna is not that of typical Pleistocene Rancho La Brea, whatever its relation to the chimney fauna which runs through it. In view of this fact together with the already noted occurrence of extinct types actually in the chimneys, we feel that the truth regarding the bones associated with the human remains will not be greatly distorted by considering the whole collection together. Only in this way do we have sufficient numbers of specimens for proper comparison with other, more typical Rancho La Brea pits.

On the basis, then, of the figures in the right hand column on the list of species, we have derived the following conclusions regarding the avifauna of pit 10, as compared with that of the typical Pleistocene of Rancho La Brea.

The most significant changes which took place in the avifauna of

The ~~main~~ chimney ~~includes~~ includes

Buteo borealis *Umbellus*
Troglodytes *Polypus pictus* &
Cathartes *Aquila*
Agelaius *Acrid*
Neotoma *Tyr*
Corvus *Corvus corax*

on to our former paper
 and the material from the sump
 contained specimens of
B. swainsoni
Cathartes
Tyr
Sturnella
C. corax

note
 comment
 on "locality"
 of "Pit 10"
 passage
 in letter

add
 note on
 3rd
 chimney
 fauna
 C. corax &
 Sturnella
 present
 among
 passages

The Avifauna of Pit 10

Rancho La Brea

relate to list

The most significant changes which took place in the avifauna of Rancho La Brea during the time which elapsed between the accumulation of the typical Pleistocene deposits and those of Pit 10, are found in the raptores and passerines.

In the raptores, the large, and extinct forms are greatly reduced in abundance, while individuals of the small, existing species show a marked increase. The owls, hawks and falcons have become the dominant avian predators, though most of the larger species still have a scant representation. The ratio of individuals of the large species relative to the total raptorial count has dropped from 63 per cent to 11 per cent, while the smaller forms have increased from 36 per cent in the typical Pleistocene assemblage to 88 per cent in Pit 10.

This change in the abundance of raptores is significant particularly as it reflects the general change which has taken place in the entire fauna -- the disappearance of the larger Pleistocene mammals, the diminishing number of the larger non-raptorial birds, such as the Stork and Turkey, and the increasing numbers of the smaller mammals, and the passerine birds.

In the passerine group, the principal changes have to do with the local extinction of species that have ^{since} persisted in other regions. Thirty per cent of the small birds of the Pleistocene are now locally extinct and were absent in Pit 10. Several of these species are important as indicators of biotic and climatic conditions. The changes in environment indicated by the disappearance of these forms



consisted of a retreat of the live-oak and brushland associations, giving way to grasslands. In Pit 10 the increase in grassland types is marked. In one instance, that of the Western Meadowlark, there was an increase, relative to total number of passerine individuals, from 12 per cent in the Pleistocene to 69 per cent in Pit 10.

The environmental changes thus indicated bespeak a considerable lapse of time between the accumulation of the typical Pleistocene deposits and those of Pit 10.

Looking at the avifauna of Pit 10 as a whole, we find here an important link between the typical Pleistocene and the typical Recent. Ten of the seventeen extinct species associated with ^{Pleistocene} ~~typi-~~ ~~cal~~ Rancho La Brea, are present, but all are so reduced in numbers as to comprise but 5 per cent of the total number of individuals, where before they represented about 40 per cent. We see in this assemblage, then, an intermediate stage in the extinction of birds usually considered as typically Pleistocene. The avifauna as a whole, however, resembles that of the Recent more closely than the Pleistocene. Therefore, if a line is to be drawn between these periods, Pit 10 ^{should} ~~would likely~~ fall into the Recent.

Hildegarde Howard, Los Angeles Museum, Los Angeles, Calif.

Alden H. Miller, University of California, Berkeley, Calif.

Photo 49 shows "Tag 10 = datum"

Therefore "established datum" at 15' in. under crest"
indicates that initial cut centered around ^{section} 10.

Funnel nearly pinched out at level of floor of initial cut
At this point chimney or disk coming in 12" wide

N.W. wall on line F

Lines G & 9 crossing near center of funnel surface at datum

SE extension = H & 29

From Merriam, 1914. Science, NS. vol. 40, pp. 198-203

Regarding Pit 10:

Two chimneys 3 feet in diameter each contributed to a hard asphaltic layer on the surface of the ground. At 8 feet chimneys opened in large dome-shaped asphaltic mass 8 ft. in diameter. A little more than 6 ft. down found human in northerly chimney. Bones in both chimneys went down almost to dome-like resevoir; asphalt in these chimneys was largely a soft viscous mass containing much sand and hard lumps of asphalt. South chimney contained only soft sandy asphalt -- bones in both chimneys.

Tolson - Preliminary report on the discovery of human remains
near asphalt deposit at R.L.B. V 10 Science vol. XL pp 198, 203
Aug. 7, 1914

marked by seepage from which I have had poured
out in Recent time. Two vents or chimneys filled
with asphalt (each 3' in diam.) both had contributed
to hard asphaltic layer forming surface of ground here.
Cut 8 ft chimney opened into large asphaltic
mass 8 ft more in diam. & to unknown depth.

North chimney at 6' - upper jaw - human
" " 6'-9' (reaching almost to point of
connection with bone mass)
- many more bones of the skeleton

Other pits at R.L.B. - in part asphalt layers on surface -
" " pipes, perches & chimneys then which
oil came up from lower strata

Small coll. of birds near upper end of No. 1 chimney contains
several birds dif. from those of the 2 chimneys & matrix
here different also. May rep. older fauna embedded
in rel. by ancient dep. then which (or near which) the North
chimney passed.

Lower jaw of horse 3', near Terry in North chimney
slender & apparently existing domestic horse, the space
between back & front teeth ^{seems} shorter than dom. horse about
same length as that of R.L.B.

copy
Wynne's
field notes

5 pages

PIT No. 10

Jan. 29, 1914

Began work with dynamite to remove heavy deposit of hardened asphaltum, about 3-ft. above land surface adjoining on the southwest. Made cut $3\frac{1}{2}$ -ft. wide, N.E. and S.W. Found soft material 1-ft. under crest of outcrop. Established datum at 15-inches under crest. Many bird and small mammal bones just under datum in matrix of tar-soaked sand, but containing much water and the bones mostly too soft to be saved.

January 30

Great quantities of bones of bird, fox and coyote from 2-ft. to 3-ft. Matrix unchanged in character. Covers only a small space, not more than 3-ft. along S.E. wall, which apparently cuts through it. Stub of deer antler, also fragment of skull, found at $2\frac{1}{2}$ -ft.

January 31

Character of matrix and bones unchanged, except traces of bear.

February 2

Bear skull and several leg bones, at 4 ft.; also vertebra and bones of cub bear, many coyote and one badger skull. Deposit shows V-shaped where S.E. wall cuts it.

February 3

Cutting 6-ft. square on S.E. side of initial cut, to cover remainder of deposit shown in wall and explore ground in that direction.

February 4

Extension shows deposit funnel-shaped and cut nearly in half by S.E. wall of initial trench. Funnel contained the usual bird and small mammals, with considerable bear, including fragments of cub skull, and one wolf at 3-ft. Elsewhere extension is absolutely barren, in bluish clay. Abandoning north half of this at 4' and carrying down south half to floor of initial cut. Funnel nearly "pinched out." "Dike" or "chimney" of partly hardened asphaltum, 12-inches wide, crowding in, in original cut, along line of S.E. wall, from N.E. Pit sectionized, N.W. wall on line "F", lines G and 9 crossing near center of "funnel" surface at datum.

February 5

Right upper jaw of Homo at $6\frac{1}{2}$ -ft. in burned (?) asphaltum of dike, scapula slightly lower, and toward face of N.E. wall, both in Sec. F-10.

it must
start at least
as far NE as H
of section 49+50
machine
starts
in F-10
see photo
26, 46, 50
noting dates

photo reverse these - photo probably wrong
all in agreement scapula higher in photo because
farther away toward NE wall. General position, not level,
shown in photo 36

Does this sound
like the material which
might have dropped
in from the outer matrix?

February 6

Photo. No.36. "Dike" or "chimney."

*yes but not
in ground which
dug but not
into \$10*

February 7

Vertebra and lower jaw found at 6'9" in tar and sand matrix, also ulna and radius. Femur exposed in F-10.

*get this?
especially in
reference to
remains of H. s.*

February 9

Note → Cranium, femur, humerus, ulna and vertebra removed at 7 to 8-ft. Humerus of Teratornis 4-inches below and 10-inches to east of cranium. Tar seepage heavy, into S.W. part of cut. Apparently a reservoir to west of cut, in F-8 and 7, or under N.W. wall of these sections, has been tapped. Six ~~part~~ pails of tar removed this morning from "sump" in F-8.

February 10

Extending cut S.W. through F-8 & 7 and down to level of floor in F-10. Homo femur in sight, beside bear rib, at 7'10", in F-10.

106 photo 46

February 11

Cut in F-8 & 7 down to 7 $\frac{1}{2}$ -ft., through the clay and into a tar quicksand, barren of bones. Removing muck pile with team and scraper.

February 12

Left upper jaw removed at 8 $\frac{1}{2}$ -ft. Femur exposed for photo.

February 13

J.C.M. visit

Three photos (Nos.46-47-48), Femur removed. Mass of large bird bones, and two vertebrae of cub bear removed. Chimney reaching across F-10 & 9, into F-8, to tar "sump." Cervical vertebra of bear in edge of sump at 8'9", also phalanx ~~near~~ near sump. No homo.

February 14

Atlas of homo in edge of sump at 8'10", also bear phalanx. Exposure of clay walls turning them from a bluish green color to a dirty tan, and cooking out oil contained therein so that checks in these walls are black and gummy with asphaltum.

February 16

Right frontal bone found at 8'8". Suspending work for the present. Two photos (Nos.49 & 50).

February 18

18" of water in F-9 & 10, from heavy rain. Bailed out.

February 19 - 3 -
3-ft. of water. Bailed out.

February 20

2-ft. of water. Bailed again. Walls dry above water level, protected by canvas from rain.

February 21

Pumped out 2-ft. of water.

February 22

Pumped twice. Seeping heavily from near surface in H & I, 9, also in F-11, likewise near surface.

February 23

Pumped in morning. Bailed dry in P.M.

February 24

Bailed again. Only a few inches of water. Miller working dump, with instructions to save every fragment of bone.

February 25

Bailed in morning. Tar cleaned out in P.M. Canvas removed to allow pit to dry. Constant small seepage at $2\frac{1}{2}$ -ft. in F-11, - (from direction of old University pit), also from S.E. extension (H & I-9).

February 27

Considerable cave-in, on N.W. wall just over tar quicksand, in E-8 & 7, exposing large mass of sand underneath the wall. Wall braced to prevent further damage. Removed part of caved material and cleaned pit.

February 28

Bailed out 5" of water. Miller finding bear phalanges in dump, also fragments of upper and lower jaws of Little Antelope.

March 2

Bear dorsal in dump.

March 6

Working again. Worked bottom down 6-inches. Found two bear vertebrae and quantity of bird and small mammals, mostly too soft to save.

March 7

No digging. Miller working on ^dump again.

March 18

Proportion of bear material increasing. Now down to 13-ft. and deposit rich as ever.

March 20

Deposit exhausted at 13 $\frac{1}{2}$ '. Digging suspended.

March 23

Photo of "reservoir" (No.71). Survey of this reservoir shows the following: Tapped at 7-ft. below datum. 7-ft. wide (N.W. to S.E.) at 8-ft. depth, on line 8. Extends at least to line 6. Known depth, 6 $\frac{1}{2}$ -ft. Roof arched, of solid, tough clay. Contents of reservoir, tar-soaked ~~and~~ sand, very gummy, and as far as explored, barren of foreign material except that portion lying under, or adjacent to, funnel-shaped vent and "dike"; this portion only was filled with bones.

March 25

Dr. Merriam visited pit today. Photo of N.W. wall in F-10 & 11, near surface (No.82) also projecting corner of S.E. & N.E. walls, in G-10 (No.81). All weak spots timbered.

March 26

Inspection N.W. wall in F-10 & 11 shows the following: At the surface a cap of rock-like asphaltic formation, 9" to 18" in thickness, extending downward to datum on line 10. (At this point datum is 15" below surface), where numerous lumps of a brownish substance, very light in weight (oxidized asphaltum ?) intrude. Below, at 1-ft. under datum, a sandy, tarry matrix, this followed by a heavy, gummy clay, bluish-green when freshly cut, but soon changing with exposure to a light tan color, and the seams blackening with oil. At 6-ft. a thin stratum of flour-like sand, about 3" thick, then clay again, but harder and with occasional very small pebbles, this giving way at 9-ft. and below to still harder, but friable, dark material.

In face of cut (N.E.) in F-10, at 6-ft., in contact of "dike" with clay, was a lump of oil-soaked clay, size and shape of a hen's egg. Occasional pebble and small gravel, rounded and smoothed, around 8'6" to 9'.

✓ In S.E. face, in G-10, at 8-ft. sand stratum shows, with some small gravel from 8-3/4-ft. to 9 $\frac{1}{4}$ -ft.; underneath the same dark, friable earth as encountered in opposite wall.

Note. - Datum established for Pit No.10 is 164.7 feet above sea level.

Merriman - letter April 14, 1914 - expects to spend couple of days taking final look at Pit 10 & review entire coll obtained in assoc with human remains. I would like them to go over with Mr. Wyman all of his notes & to look over photos & sketches.

April 17 ¹⁹¹⁴ planning to be done the next Tues. & p. 5 LeBrea

May 14 1914

" 27 "

" 28 "

April 30

Daggett May 1 - Fisher restores lower jaw with instructions to restore in white as apparent & not to restore missing parts or contours

Merriman May 2 suggests final restoration of human skull should "put in zygomatic arch - fill out breaks in skull especially in frontal region" mentioned artist making sketches showing bones in place.

Merr May 3 - Mentions avoiding shininess of asphalt bone by softening light by having it pass thru tissue paper before falling on specimens
Sketches of drawings showing chimney - going effect of "hanging in the air". Miller's list of birds arrives

Daggett May 12 - speaks of sending small box containing mammal & bird bones from bre in cranium of house. No of bird bones from this sent to Miller (May 11 ^{note} to Miller sending them tells Miller to notify Merriman of ident. of birds)

Merriman letter May 18 - says artist & Wyman ^{that day} about Pit 10 same fauna. Has turned over bones from inside cranium to block to ident. Merriman going & leaving all work on Pit 10 in charge of filing case in Univ. library.

Dayzett May 26 - refers to possible trouble (or criticism)
from Larkin or Gilbert when paper presented

Merriman June 3 - speaks of giving report & Science
which will be only a preliminary report. Says
"Following this statement shall go over
The ms of my article carefully a no. of
times before turning it over for printing."

June 13, 1914 Refers to Terry from north chimney
Had made certain of Miller's letter of
Terry hum. found near skull & one of
coracoids found in vicinity of 4' in depth.
Did Miller pass on both coracoids from
near depth of 4' as being Terry? Just
may have been whatever sp. is not out and
identified?

(Dayzett pencilled note
on margin says 1 cora.
Terry's
F 10, 2 1/2 - 4')

Says "am having Wyman's
original notes typed & shall send
original copy to you next week by
registered mail. I shall also return his
original drawings"

Dayzett June 18 Says regarding 2 coracoid of Terry
found near 4' level in Pit 10
"am sending the one marked on box as F 10-
2 1/2 - 4'. This lot has one of Dr. Miller's small
white cards placed among the lot of bird bones,
but the card is blank. As this lot is the orig. box
with card on end of it, he may have considered further
marking unnecessary. The card being used when Sather
made it necess. to start a new box.

Merriam July 25, 1914 - refers to having 8
articles in So. Calif. Acad. Sci. Bul

★ for July on Ranales by Bica & Stelety
speaking of Sci article in press.

June 22 Merriam - received Terry card
+ returned. Says also
(marginal note) "Wynne's original
says received June 24, 1914" sketches are not

★ → photographed yet & I put
them in file press & they

New letter from Merriam
May 28, May 27 (det. of Miller on birds from Caany)
May 14 (says forwarding drawings to Wynne
for suggestions that day)

Merriam Feb. 14 says "I had a very good opportunity to
go over the occurrence of the human
remains with Mr. Wynne yesterday afternoon
speaking of making them from L.A. (no doubt
have actually been here). Spoke of coming down over
Feb. 23

Ray Jr. Feb. 17 says coming but 10 to leave status
first temporarily. Feb. 21 floods in L.A.

Dayzett March 18 -

Pt 10 has been cut down to clay on the bottom. The shelf on the north was also ~~been~~ cut down to clay. It contains the rest of what you called the "dyke". Many bird bones were found including 2 coracoids of the teratornis & fragments of mammal skeletons. Near the surface there were some bones of horse & fish. altho there is a suggestion that there may be modern additions.

The dump in lower south corner has been followed down & the soil contains many bird & small mammal bones & some vertebrae of that gray bear found higher up. No more human bones found, unless Fischer on closer investigation finds something small.

Pit 10 -

outer matrix - fields ancient - surrounding the chimney
inner " homogeneous bituminous more recent

#33 April 22, 1914 - Pit 10 - J.C. Merriam U.C. Beebe
ret'd Jan. 22, 1931

A Small mammals # 5

Box 1 P 10 initial cut 2-7 ft Feb. 7, 1914

B Mammals only in box from

Box 2 P 10 7.11 2 1/2 - 5 1/2' also packages in the
box - P. 10 7 9 1/2 of 10. 9 8 9 2

C Small mammals # 6

Box 3 P 10 E + F - 8.9 to 13 1/2' in
Mar. 1914

D Box 4 P. 10 Hand dep, under 8 ft
J.D. + J.C.M.

4327
3530

797

3545

3537
58

E package P. 10 P. 10 8 1/4 - 9'
Feb. 16

3887
3837
3610

Birds from Pit ascending to
Wynne's notes
Box 18 birds initial
cut 2-7' from 8 Feb 7 1914
Box 22 E + F 8 9-13 1/2' March 1914
Box 23 dump March 1914
Box 25 F 11, 2 1/2 to 5 1/2'
Homodeposit Mar 1914

another box
from this depth
contained birds
5 must be part
of this box
No record of
which bones they
are

$$\begin{array}{r} 2418 \\ 6829 \\ 4231 \\ 6892 \\ \hline 0 \end{array}$$
$$\begin{array}{r} 20 \\ 15 \\ 22 \\ 18 \\ \hline 20370 \end{array}$$

The Avifauna Associated With Human Remains
At Rancho La Brea, California

By

Hildegarde Howard and Alden H. Miller

In the course of
During the excavations in the asphalt deposits at Rancho La Brea, Los Angeles, California, in 1914, human bones were discovered in one locality, Los Angeles Museum pit number 10. In August of the same year, Dr. J. C. Merriam published a preliminary report on the discovery (Science, n.s. vol XL, pp. 198-203), in which he came tentatively to the conclusion that the occurrence was of considerably later age than ^{that of} the typical Pleistocene Rancho La Brea fauna. In concluding, however, he stated that only after ^{a detailed and} an exhaustive study of the typical Pleistocene Rancho La Brea fauna, compared with that of pit 10 and of the existing fauna of California, could the final conclusions as to the significance of the occurrence be determined. No further report has been published on the subject, ~~however,~~ until this time.

~~Now,~~ In the light of more recent discoveries of man ^{man} associated with prehistoric animals in ~~various~~ other deposits of Quaternary age, interest in Rancho La Brea pit 10 has been revived. In the interim since 1914 considerable information regarding the fauna of the ^{pits} ~~Pleistocene~~ has been assembled, and it is now possible to make definite comparisons between pit 10 and the typical Pleistocene pits. The present paper is concerned with comparisons of the avifauna ^s of the two assemblages. In preparation ^{comparisons} we have made a detailed study of the entire bird collection from pit 10, ^{the} which numbering ^s over seven thousand bones. It is probable that these ^{are included} include specimens additional to those originally examined by Dr. Loye Miller at the time of Merriam's report. Furthermore, as a result of intervening studies of the extinct species from the typical Pleistocene deposits, specimens which previously passed unnoticed are now recognizable, and thus the list of extinct birds represented in pit 10 is increased to nine. Miller's report (Merriam, op. cit. p. 201) included four extinct species from this pit. However, three of these were thought to have been

^{entombed at a} ~~introduced in a different~~ ^{time} manner than the other bones. Regarding this point, Merriam says (loc. cit.) "A small collection found near the upper end of the north chimney contains a number of birds which according to Dr. Miller are quite different from those certainly known from the two chimneys. The matrix in which this small collection was found is also different from that in the chimneys. It seems probable that these specimens represent an older fauna embedded in a relatively ancient deposit through or near which the north chimney passed."

In view of the possibility that the other extinct species now identified ^{also} belong ~~also~~ to this "small collection" ^{which was not segregated as} ~~(for it was not clearly~~ ^{a unit} set ~~apart~~ from the rest of the material from pit 10, we have carefully reviewed available records concerning the 1914 excavations. The following account is based upon the field notes of L.E. Wyman ^{who was} in charge of the Los Angeles Museum work.

The initial cut, $3\frac{1}{2}$ feet in width, revealed a matrix of tar-soaked sand containing quantities of bones of birds and small mammals. Extension of this cut on its southeast side showed the deposit to be funnel shaped. Presumably this is the deposit ~~to~~ ^{to} which Merriam refers ^{and} as the south chimney, ^{and} which we shall now call funnel no. 1. To the north of this funnel, and in the initial cut, a "dike or chimney of partly hardened asphaltum" ^{"crowding in" from N.E."} was encountered. This deposit widened gradually and slanted in a southwesterly direction as it was traced downward, until at a depth of about $8\frac{1}{2}$ feet it had extended fully six feet across the excavation to ~~the~~ ^{connect} with a tar sump. In the "dike" and at the edge of the sump, at depths from ^{but inches} 6' 6" to ^{but inches} 8' 10" were found the bones of the human skeleton, presumably all of one individual. The first human bones were in the hardened asphaltum, the lower ones in a tar and sand matrix.

A second funnel was encountered to the north of the first and about three feet from the "dike" at its upper end, but connecting with it by a narrow pipe at a depth of eight feet. This funnel, ^{together} with the "dike", is undoubtedly Merriam's "north chimney". The funnel was evidently

considered to be the vent of the chimney, and as such must have included the questionable matrix "near the upper end of the north chimney."

Though, unfortunately, only one-tenth of the bird specimens from pit 10 are now accompanied by data as to their former location in the pit, those for which data are available include over seven hundred bones which ^{are not} ~~are~~ definitely from funnel number 2. Seven of these (all of Recent species) bear the label "initial cut, 2'-7'", and the remainder were taken below ⁸ eight feet in the "Homo deposit", or in the adjacent underlying sump. In addition there are eighty bones from funnel 2, including Buteo regalis, Teratornis merriami, Cathartes aura, Aquila chrysaetos, Neophrontops americanus, Neogyps errans, Urubitinga fragilis, Polyborus prelutosus, Anser albifrons, Asio, Tyto alba and Corvus corax. The bones of Teratornis are those ~~to~~ which Merriam records at a depth of 4 feet in postulating the possible contemporaneity of this extinct bird with man. It is evident, therefore, that the whole of funnel 2 was not under question.

In the ^{accompanying table} ~~following list~~ the specimens from funnel 2 are omitted. The figures in the first column indicate the number of individuals represented by all other ^{identifiable} specimens which bear data. Those for which no data are at hand are listed in the second column. Among the labelled specimens there are eight extinct species represented by eleven individuals. The larger collection contains nine extinct forms with 25 individuals. As the labelled bird specimens were found in boxes with the mammal bones from pit 10 and give evidence of being an atypical assortment, ^{the comparison of} ~~comparative ratios~~ ^{of extinct forms in the two columns} are of little value. ^{It is, however,} They show relatively slightly greater abundance of extinct individuals ⁱⁿ for the labelled group than ⁱⁿ for the other. ^{In any} At all events, there can be no doubt that extinct forms did occur elsewhere in pit 10 than in the questionable matrix "near the upper end of the north chimney".

Referring again to Wyman's notes, it is clear that nowhere in the pit 10 excavation were the typical Pleistocene mammals encountered. Discussion with Dr. Chester Stock, who has been recently reviewing the mammal bones from this pit, corroborates this fact. It would seem that had

comprising the main part of this chimney

the matrix in question been truly Pleistocene, some evidence of the typical mammals might be expected to appear also, unless its very small extent precluded this possibility. In that event, even the number of birds included must have been too few to have noticeably affected the aspect of the ^{entire} complete collection. In consideration of this point, together with the ^{from the pit} already noted occurrence of extinct types ^{at depths of} under eight feet in the "Homo deposit", we feel that the truth regarding the bones associated with the human remains will not be greatly distorted by considering the whole ^{pit 10} collection ^(except funnel 2?) together. Only in this way do we have sufficient numbers of specimens for proper comparison with other, more typical Rancho La Brea pits.

The adjacent table presents a complete list of avian species from the typical Pleistocene Rancho La Brea collections of the Los Angeles Museum, compared with the combined labelled and unlabelled collections from pit 10, and with two separate Pleistocene pits in which the abundance of birds is approximately the same as in pit 10. The two individual pits are presented to show the variation which may exist between the older pits, contrasted with the wide difference between both of these and pit 10.

It will be noted that although the number of extinct species is less in pit 10 than in the Pleistocene pits, the ratio of extinct to total number of species is actually greater in the pit 10 collection than in the combined Pleistocene avifauna. Of greater value in estimating the age of the deposit is the number of individuals representing these extinct forms. For example the extinct vulture, Coragyps occidentalis, though still represented, is now reduced to but three individuals, while in pit 4, it numbered over sixty. The Recent Cathartes aura, a subordinate species in the Pleistocene, outnumbers Coragyps in pit 10, surpassing any single Pleistocene pit in individuals represented.

In figure 1 the totals of individuals of extinct species compared with those of Recent species are illustrated graphically for pits 3, 4, and 10. The difference between pit 10 and the two Pleistocene pits is immediately

apparent. ^{of extinct / species} In the latter the ratio of ~~extinct~~ individuals to total number of non-passerines* ranges from 33 to 49 per cent, ^{whereas} while in pit 10 only ⁵ five per cent of the birds are extinct.

* ^{calculating} In estimating these ratios the passerines (and woodpeckers) are not included. The bones of these smaller birds were less carefully collected in some of the Pleistocene excavations than in others, with consequent variations in totals resulting. Ratios would naturally be influenced by variations of this nature.

Equal in significance with the reduction in extinct individuals in pit 10 are the changes within the raptorial and passerine groups.

In the raptores, the large, as well as the extinct forms are greatly reduced in abundance, ^{whereas} while individuals of the small, existing species show a marked increase. The owls, hawks and falcons have become the dominant avian predators, although most of the larger species still have a scant representation. Figure 2 illustrates this difference between the Pleistocene pits and pit 10. The ^{proportion} ratio of ~~number~~ of individuals of the larger birds (Condors and Eagles) relative to the total raptorial count, ranging ^{or} from 52 to 63 per cent in the avifauna of the Pleistocene pits, ^{but it} has dropped ^S to 10 per cent in pit 10, while ^{proportion of} the ratio in the smaller forms (hawks, owls and falcons), ^{which} ranging ^{as} from 13 to 29 per cent in the Pleistocene deposits, ^S has increased to 86 per cent in pit 10.

This change in the raptores is significant particularly as it reflects the general change which has taken place in the entire fauna, ^{that is,} the disappearance of the larger Pleistocene mammals, the diminishing number of large non-raptorial birds, such as the stork and turkey, and the increasing numbers of the smaller mammals and birds.

The ~~charts in~~ Figures 3 and 4 illustrate the differences in abundance of the various orders of birds as represented in pit 10 (~~fig. 3~~) ⁱⁿ and the combined Pleistocene assemblage (~~fig. 4~~). The outstanding difference, ^{of} ~~of~~ ^{to be} ~~figure 3 with figure 4~~ ^{noted} ~~in comparing~~ ^{where} ~~the Pleistocene~~, is the enlargement of

the strigiform sector, with accompanying reduction of the falconiforms ^{in pit 10.}
 In addition, however, the diminishing number of turkeys shows itself in
 the very small sector ~~now~~ representing the Galliformes. The reduction
 of the storks is less marked, for even in the Pleistocene the ~~storks~~
 were never represented by more than ten individuals in a single deposit
 and were ~~totally~~ lacking in three of the pits, while the turkey was one
 of the ~~most~~ characteristic birds of the area, and evidently ^{was} a resident
 if we may judge by the numbers of bones of very young chicks which are
 found in the Pleistocene asphalt. It is ^a ~~a matter of~~ question whether
 or not Ciconia maltha should be included among the ~~the true~~ pit 10 birds
 on the basis of the single fragmentary coracoid for which no data ^{as to location in the pit} are
 available. We have deemed it advisable to omit the specimen in drawing
 our conclusions.

Equal in significance with the reduction in extinct individuals in pit 10 are the changes within the raptorial and passerine groups.

In the raptores, the large, as well as the extinct forms are greatly reduced in abundance, while individuals of the small, existing species show a marked increase. The owls, hawks and falcons have become the dominant avian predators, though most of the larger species still have a scant representation.

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The difference in abundance of charadriiforms is unimportant, for certain of the individual Pleistocene pits have even fewer shorebirds than are found in pit 10. The difference in the anseriforms, however, is apparent in comparing pit 10 with any single Pleistocene pit. Whether or not this can be taken as an indication of greater ^{precipitation} humidity during the earlier period is problematical. In none of the pits are anserines ~~very~~ abundant.

Woodpeckers, even including the ground-foraging ~~species~~ Coccyzus, apparently are absent from pit 10. This situation contrasts with their moderate representation in Pleistocene pits in which Coccyzus and Asyndesmus usually are represented.

The passerines show a definite increase, ^{in pit 10.} Lest the Pleistocene ratio be affected by those pits in which the smaller birds were overlooked, comparisons were made with the separate pits. Pit 16, from which the largest ^{Pleistocene} "micro"-fauna was recovered, shows the nearest approach to Pit 10, with ^{identifiable} 157 passerines (and ~~7~~ woodpeckers?), representing 9 per cent of the total avifauna, contrasting with 16 per cent in pit 10.

More important, however, than the difference in actual numbers of passeriform individuals are the changes which may be noted within the group itself. These changes have to do with the local extinction of species which still persist in other regions. Thirty per cent of the small birds ^{recorded from} of the Pleistocene ^{pits} are now locally extinct, whereas only two per cent of the pit 10 passerines have thus disappeared. Several of the species involved are important as indicators of biotic and climatic conditions. The changes in environment shown by the disappearance of these forms consisted of a retreat of the live-oak and brushland associations, giving way to grasslands. In pit 10 the increase in grassland types is marked. One grassland species, the Meadowlark (Sturnella neglecta) increased relative to total number of passerine individuals

live oak association

Related to this diminution in live-oak associated is the absence of woodpeckers in pit 10. In most of the Pleistocene pits Colaptes and Asyndesmus are present in small numbers, and there are ^{also} records of other, more strictly forest-dwelling, woodpeckers.

from 12 per cent in the Pleistocene to 62 per cent in pit 10. Pica
nuttallii, a live-oak associate, diminished from 35 per cent to 1 ^{% per cent.}

The environmental changes thus indicated bespeak a considerable lapse of time between the accumulation of the typical Pleistocene deposits and those of pit 10.

Looking at the avifauna of pit 10 as a whole, we find here an important link between the typical Pleistocene and the typical Recent. Nine of the sixteen extinct species associated with Pleistocene Rancho La Brea are present ^{in pit 10,} but all are so reduced in numbers as to ~~comprise~~ ^{be} only one-tenth as abundant as they were in the Pleistocene. We see in this assemblage, then, an intermediate stage in the extinction of birds usually considered ^{to be} as typically Pleistocene. The avifauna as a whole, however, resembles that of the Recent more closely than ^{that of} the Pleistocene. Therefore, if a line is to be drawn between these periods, ^{in which the Homo remains were found,} pit 10 should fall into the Recent.

must p 8 a

Species	Individuals from known localities in Pit 10, other than funnel no. 2		Individuals from unknown localities in pit 10	
Phalacrocorax auritus	1		1	
Ardea herodias			1	
Botaurus lentiginosus			2	
Geese (3 species)	1		3	
Spatula clypeata?	1			
Nettion carolinense			1	
Cathartes aura	2		8	
Coragyps occidentalis	2		1*	
Gymnogyps californianus			1	
Teratornis merriami	1		5*	
Elanus leucurus			1	
Accipiter velox			1	
Accipiter cooperii			1	
Circus hudsonius	6		78	
Buteo borealis	6		43	
Buteo swainsoni	6		32	
Buteo lagopus			4	
Buteo regalis	3		44	
Urubitinga fragilis	1		1*	
Morphnus woodwardi	1		1*	
Aquila chrysaetos	10		38	
Spizaetus grinnelli			4	
Haliaeetus leucocephalus			3	
Neogyps errans	1		1*	
Neophrontops americanus	2		2*	
Polyborus prelorus	1		2*	
Falco mexicanus	2		8	
Falco peregrinus	2		13	
Falco columbarius			3	
Falco sparverius	1		7	
Lophortyx californica			1	
Parapavo californicus	2		8*	
Crus canadensis	1		4	
Squatarola squatarola			1	
Oxyechus vociferus			1	
Numenius americanus	1		1	
Phaeopus hudsonicus	1			
Catoptrophorus inornatus	1		1	
Larus, sp.			1	
Zenaidura macroura			1	
Tyto alba	8		92	
Bubo virginianus	1		6	
Speotyto cunicularia	6		98	
Asio (2 species)	7		56	
Corvus corax	7		26	
Corvus caurinus			1	
Corvus hesperis ^{brachyrhynchus hesperis}	2		10	
Sturnella neglecta	9		67	
Pica nuttallii			1	
Total individuals	96		686	
Total species	32-31		50	
Extinct Individuals ^{of total species}	11		25	
Extinct species	8		9	

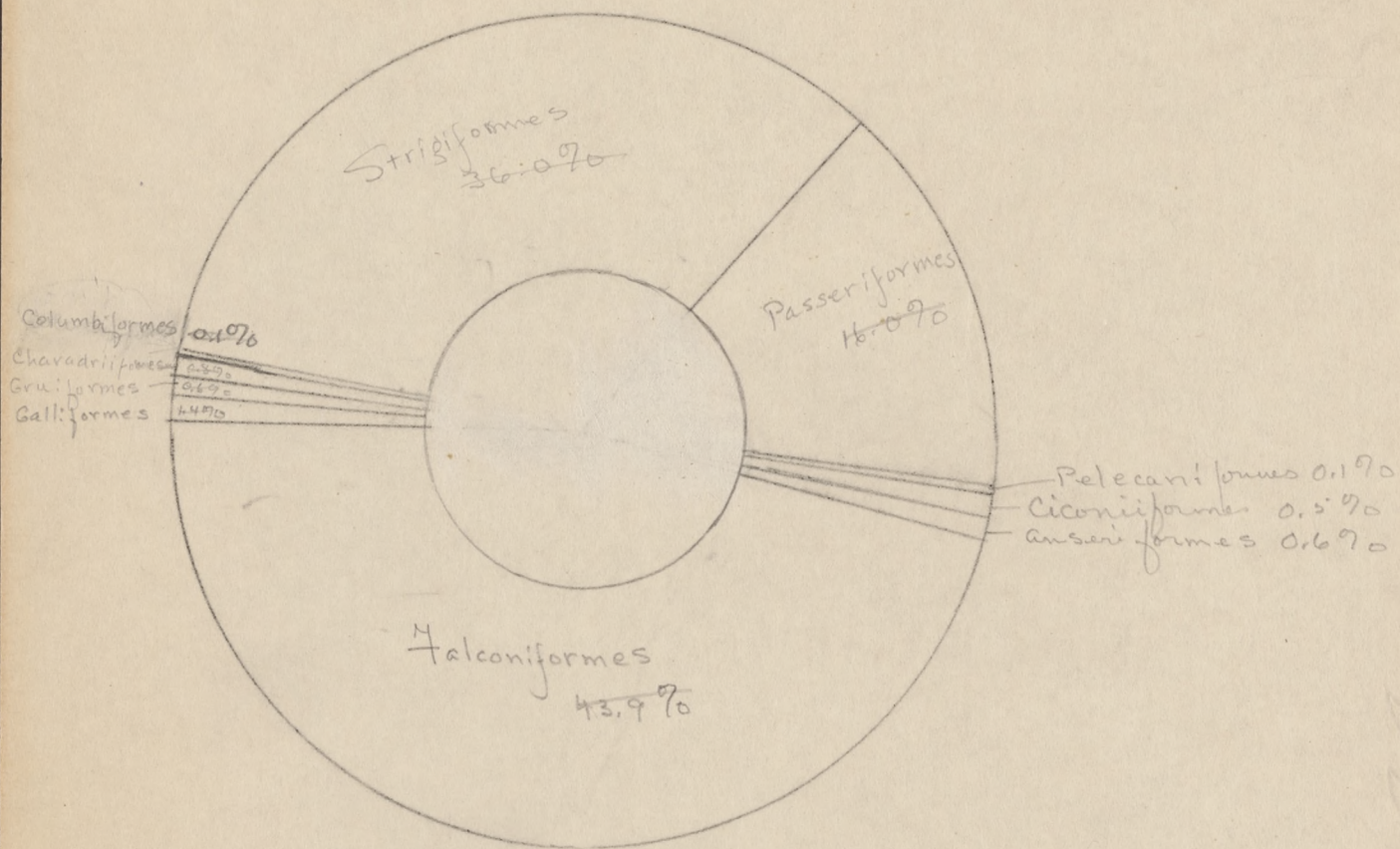
*Extinct species

Name	Individuals from combined Pleistocene pits	Individuals from L.A. Museum pit no. 3	Individuals from L.A.M. pit no. 4	Individuals from L.A.M. pit no. 10
<i>Colymbiformes</i>				
<i>Podilymbus podiceps</i>	1	-	-	-
<i>Colymbus, sp.</i>	1	-	-	-
<i>Pelecaniformes</i>				
<i>Phalacrocorax auritus</i>	-	-	-	1
<i>Ciconiiformes</i>				
<i>Ardea herodias</i>	10	3	-	1
<i>Casmerodius albus</i>	1	-	-	-
<i>Egretta thula?</i>	5	-	-	-
<i>Butorides virescens</i>	1	-	-	-
<i>Botaurus lentiginosus</i>	5	1	-	2
<i>Nycticorax nycticorax</i>	1	-	-	-
* <i>Mycteria wetmorei</i>	1	-	-	-
<i>Ajaia ajaja</i>	1	-	-	-
* <i>Ciconia maltha</i>	32	2	4	(1?)†
<i>Plegadis guarauna</i>	1	-	-	-
<i>Anseriformes</i>				
<i>Cygnus columbianus</i>	1	-	-	-
* <i>Anabernicula minuscula</i>	24	-	2	-
Other geese (5 species)	89	8	21	3
Ducks (6 species)	79	4	4	2
<i>Falconiformes</i>				
<i>Cathartes aura</i>	19	2	4	8
* <i>Coragyps occidentalis</i>	201 198*	38*	61*	3*
<i>Gymnogyps californianus</i>	213	88	33	1
* <i>Breagyps clarki</i>	22*	7*	3*	-
* <i>Teratornis merriami</i>	98*	22*	20*	5*
<i>Elanus leucurus</i>	2	1	-	1
<i>Astur atricapillus</i>	2	-	-	-
<i>Accipiter velox</i>	4	1	1	1
<i>Accipiter cooperi</i>	43	2	16	1
<i>Circus hudsonius</i>	54 (51)	18	8	84
<i>Buteo borealis</i>	47	6	8	45
<i>Buteo swainsoni</i>	46	19	1	38
<i>Buteo lagopus</i>	1	-	-	4
<i>Buteo regalis</i>	46	10	4	44
<i>Buteo, sp.</i>	9	-	2	-
* <i>Wetmoregyps daggetti</i>	6*	-	4*	-
* <i>Urubitinga fragilis</i>	78*	9*	17*	2*
* <i>Morphnus woodwardi</i>	23*	6*	5*	1*
<i>Aquila chrysaetos</i>	899	85	238	46
* <i>Spizaetus grinnelli</i>	97*	8*	30*	4*
<i>Haliaeetus leucocephalus</i>	172	11	28	3
* <i>Neogyps errans</i>	70*	3*	20*	1*
* <i>Neophrontops americanus</i>	142*	18*	40*	3*
* <i>Polyborus prelutosus</i>	272*	28*	40*	2*
<i>Falco mexicanus</i>	12	1	2	9
<i>Falco peregrinus</i>	10	1	-	13
<i>Falco columbarius</i>	8	2	1	3
<i>Falco sparverius</i>	45	3	8	7

† Represented by a single fragmentary coracoid in the unlabelled material, therefore omitted in drawing conclusions.

Galliformes				
Lophortyx californica?	110	-	7	1
*Parapavo californicus	568	42	173	10
Gruiformes				
Grus canadensis	33	2	6	5
Grus americana?	2	-	-	-
Fulica americana	1	-	1	-
Charadriiformes				
Oxyechus vociferus	18	-	-	1
Squatarola squatarola	2	-	1	1
Capella delicata	8	1	-	-
Numenius americanus	5	-	-	1
Phaeopus hudsonius	4	2	1	1
Catoptrophorus inornatus	-	-	-	1
Totanus melanoleucus	19	-	-	-
Sandpiper, sp.?	1	-	-	-
Limnodromus griseus	3	-	-	-
Limosa?	2	1	-	-
Recurvirostra americana	1	-	-	-
Shorebird, (2 species)	27	-	-	-
Rissa?	1	-	-	-
Larus brachyrhynchus	1	-	-	-
Larus, sp.?	-	-	-	1
Columbiformes				
Columba fasciata	2	-	1	-
*Ectopistes migratorius	3	-	-	-
Zenaidura macroura	28	5	-	1
Cuculiformes				
Geococcyx californianus	17	1	4	-
Strigiformes				
Tyto alba	68	28	3	100
Bubo virginianus	114	6	21	6
Otus asio	9	1	-	-
Glaucidium gnoma?	3?	1?	-	-
Cryptoglaux acadica	1	-	-	-
Speotyto cunicularia	31	9	3	104
*Strix brea	13	2	2	-
Asio (2 species)	67	23	5	57
Total individuals	4047	531	857	628
Total species	85	47	47	47
Extinct individuals	1646	185	425	31
Extinct species	16	12	14	9

Ratio extinct individuals to total 40.6% 34.8% 49.5% 4.9%
Ratio extinct species to total 18.8 25.5% 29.8% 19.1

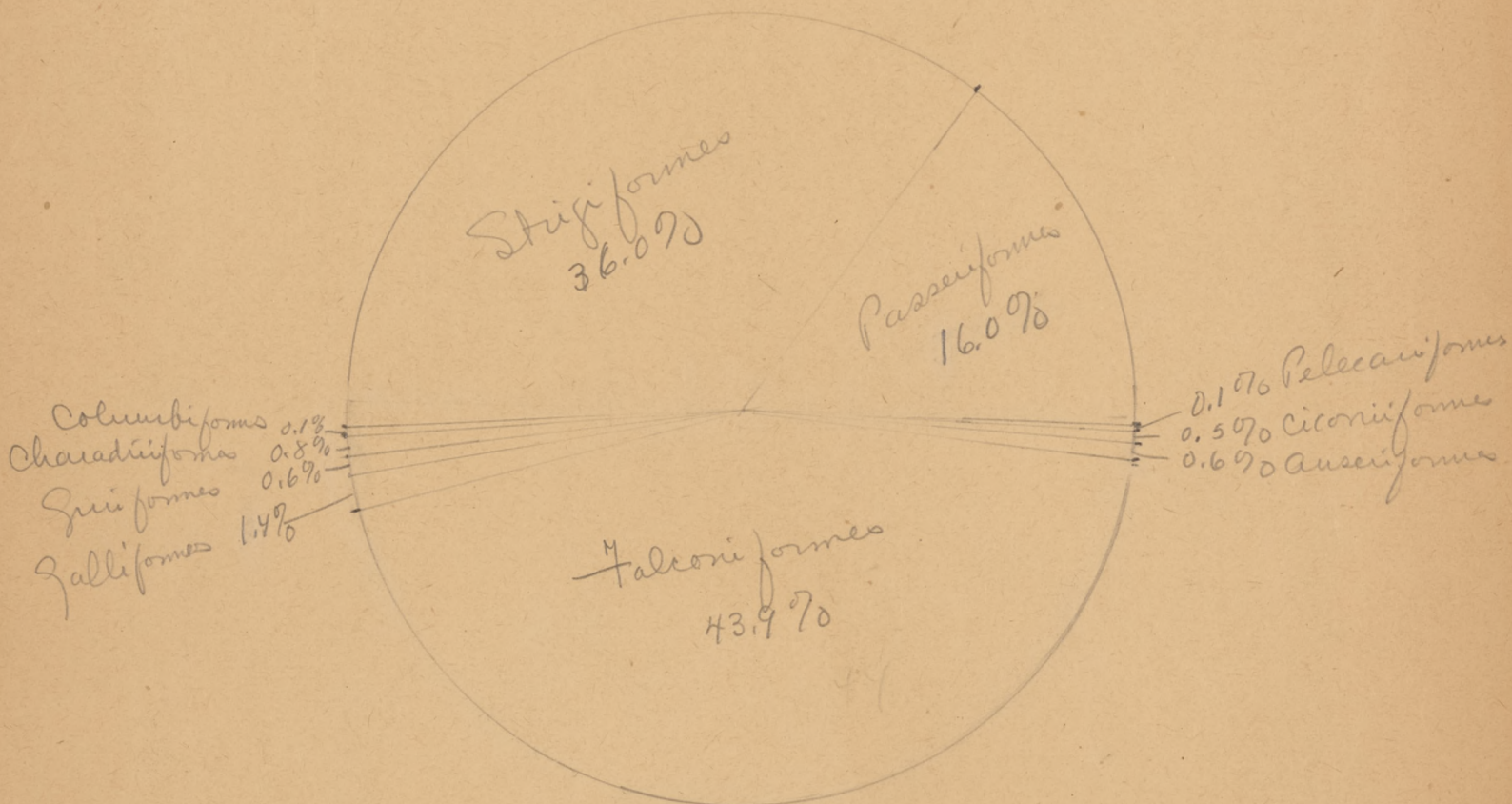


omit numbers on new chart

6a

PT 10

Fig. 3



PT 10

$$\begin{array}{r}
 163 \\
 23 \\
 \hline
 28 \\
 214 \\
 \hline
 1860 \\
 37 \\
 6 \\
 180 \\
 111 \\
 78 \\
 243 \\
 73 \\
 \hline
 2558
 \end{array}$$

$$\begin{array}{r}
 214 \\
 4 \\
 29 \\
 28 \\
 3 \\
 \hline
 1 \\
 192
 \end{array}$$

$$\begin{array}{r}
 42 \\
 180 \\
 84 \\
 238 \\
 224 \\
 135 \\
 22 \\
 10 \\
 \hline
 618 \\
 30
 \end{array}$$

$$\begin{array}{r}
 63 \\
 57 \\
 \hline
 96 \\
 119 \\
 58 \\
 153 \\
 6 \\
 254
 \end{array}$$

$$\begin{array}{r}
 87 \\
 64 \\
 \hline
 732 \\
 254
 \end{array}$$

$$\begin{array}{r}
 109 \\
 24 \\
 80 \\
 \hline
 213
 \end{array}$$

$$\begin{array}{r}
 122 \\
 36 = 64
 \end{array}$$

$$\begin{array}{r}
 37 \\
 6 \\
 180 \\
 64 \\
 111 \\
 213 \\
 78 \\
 \hline
 712 \\
 1860 \\
 2572 \\
 110 \\
 268
 \end{array}$$

$$\begin{array}{r}
 193 \\
 201
 \end{array}$$

$$\begin{array}{r}
 42 \\
 180 \\
 84 \\
 238 \\
 \hline
 544
 \end{array}$$

$$\begin{array}{r}
 1 \\
 24 \\
 24 \\
 135 \\
 10 \\
 99 \\
 30 \\
 544 \\
 \hline
 673
 \end{array}$$

$$\begin{array}{r}
 2632 \\
 0110 \\
 2520 \\
 099 \\
 660 \\
 1860
 \end{array}$$

$$\begin{array}{r}
 42 \\
 180 \\
 84 \\
 238 \\
 224 \\
 135 \\
 22 \\
 10 \\
 \hline
 618 \\
 30
 \end{array}$$

$$\begin{array}{r}
 5330 \\
 544 \\
 \hline
 5874
 \end{array}$$

$$\begin{array}{r}
 1860 \\
 37 \\
 6 \\
 180 \\
 111 \\
 78 \\
 213 \\
 73 \\
 \hline
 2558
 \end{array}$$

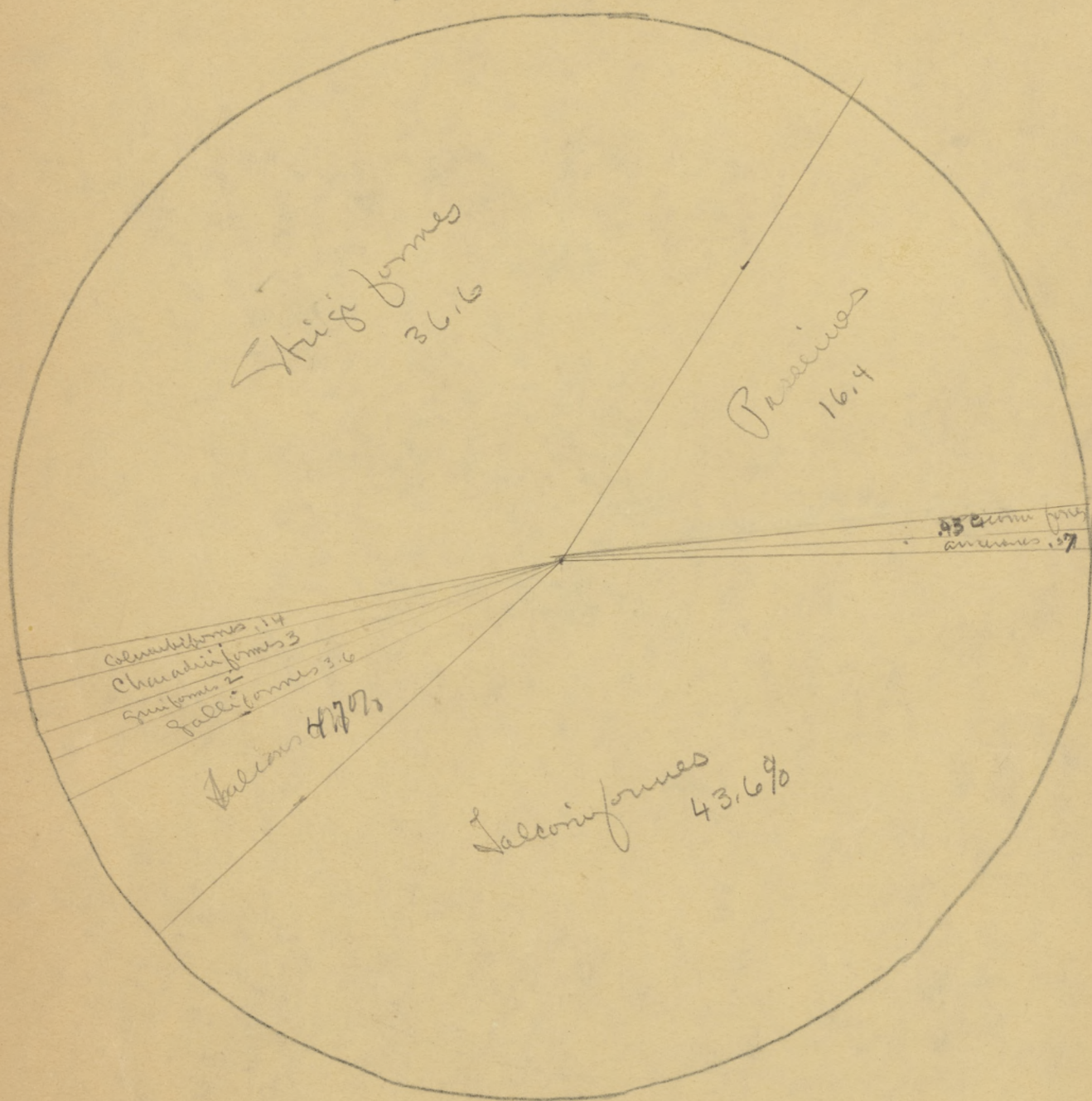
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 68 \\
 41 \\
 29 \\
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 15 \\
 55 \\
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 21 \\
 36 \\
 2 \\
 18
 \end{array}$$

$$\begin{array}{r}
 9 \\
 22 \\
 105 \\
 73 \\
 34 \\
 83 \\
 2
 \end{array}$$

66

Fig. 4

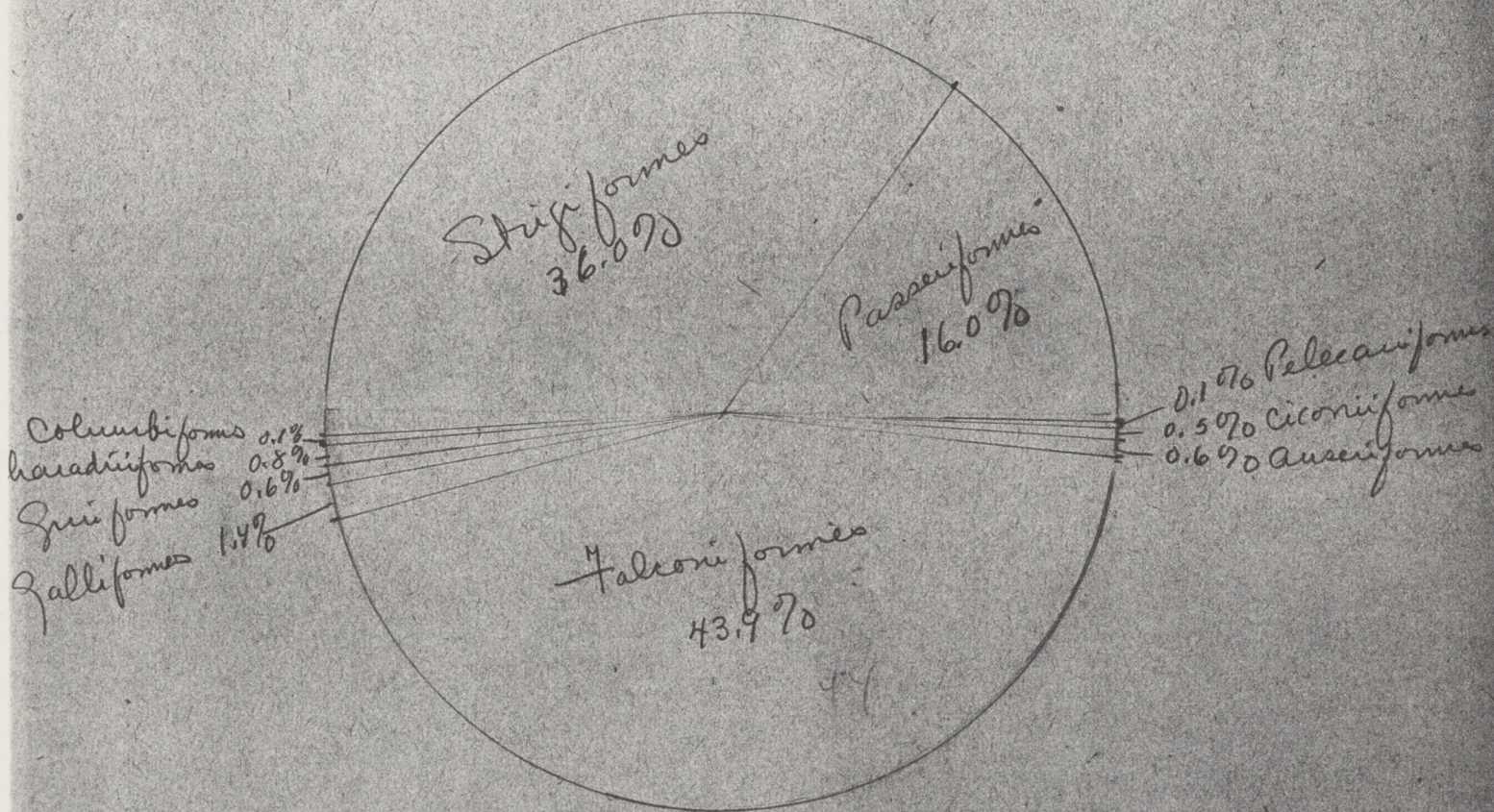
Pl 10



6a

PT 10

Fig. 3

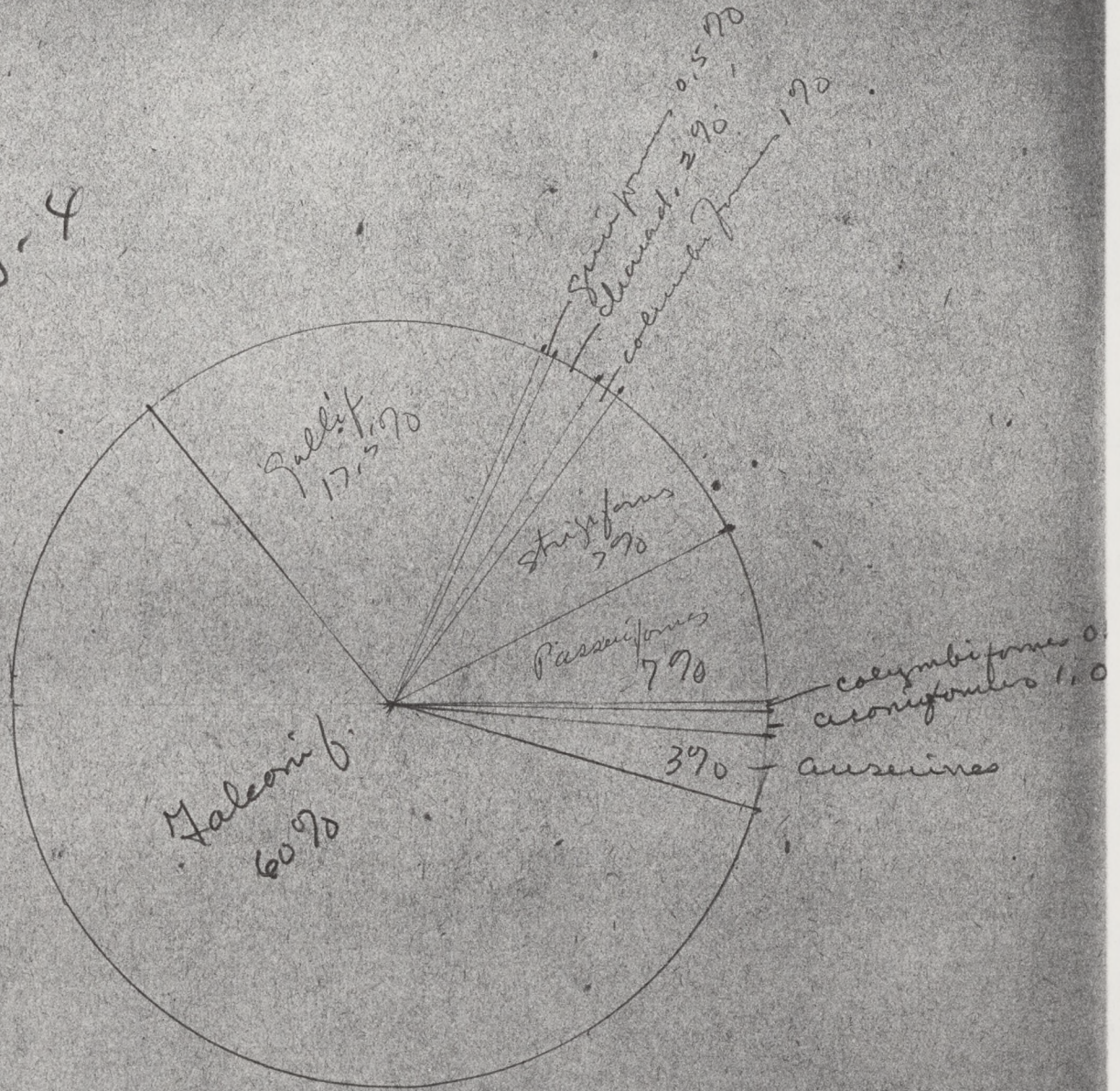


PT 10

Pt 3, 4, 16

66

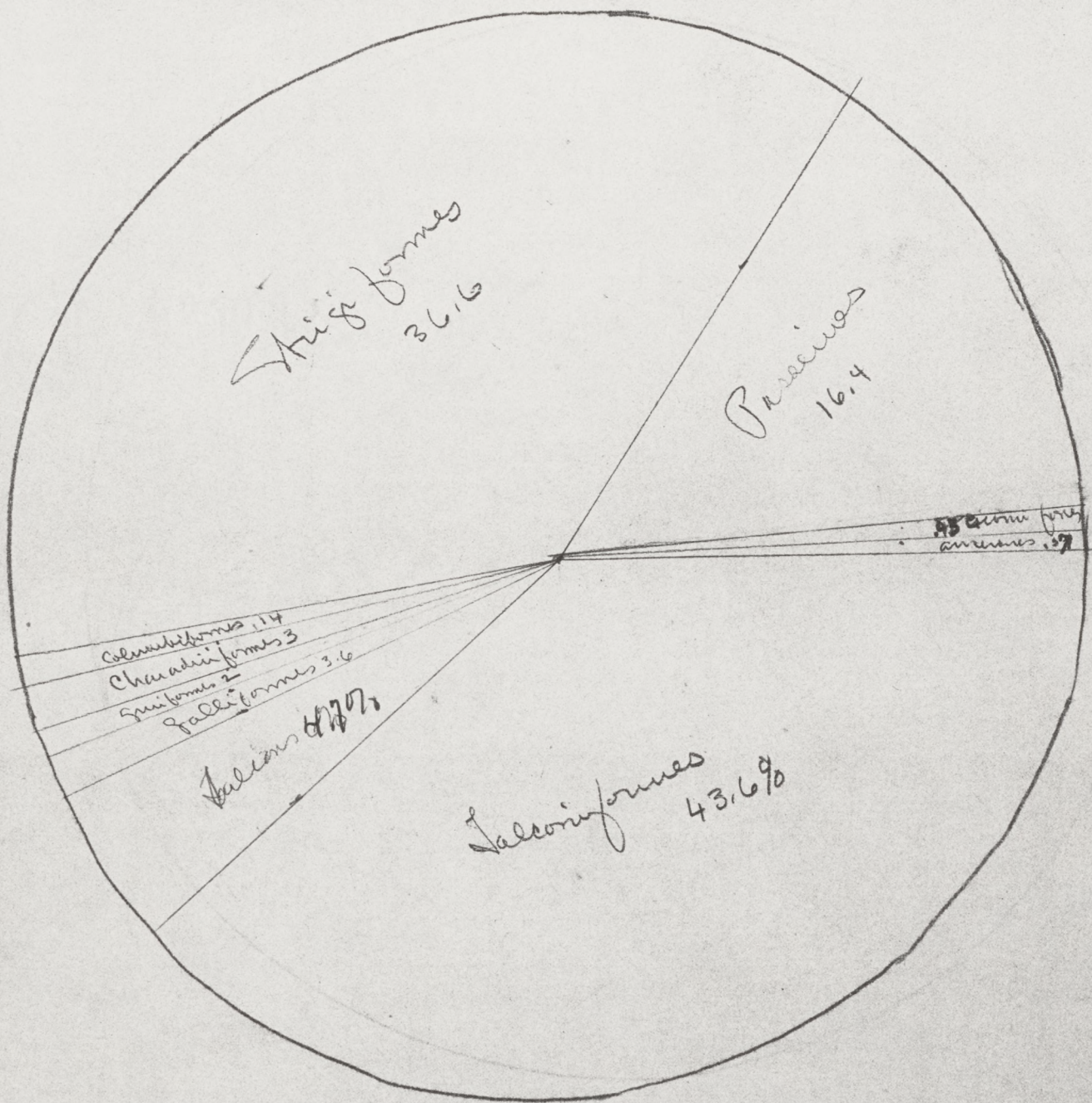
Fig. 4

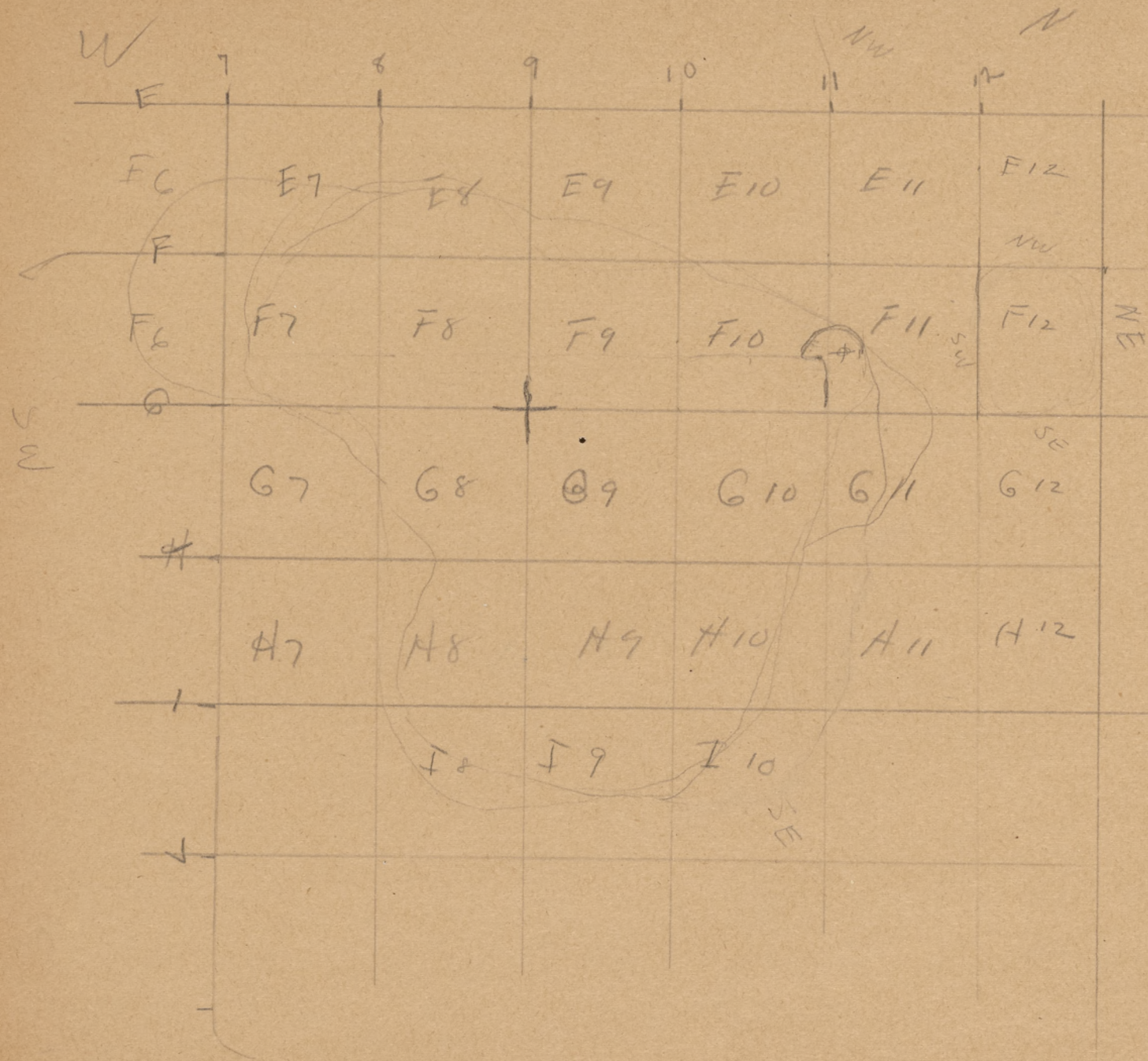


Pleistocene

This is nearly enough like the one published in my census paper to merely reprint that, I think
 III

1 Pt 10





Merry	1
RC	2
ms. B	3
Pois	4
Bill	5
Ann	6
Bob	7
Earl	8
Miss G.	9
Miss G.	
Mrs. Valle	
Louise	
Henry	
vic	
James	10
James	11
Marian	12
Grace	13

Libia

dist

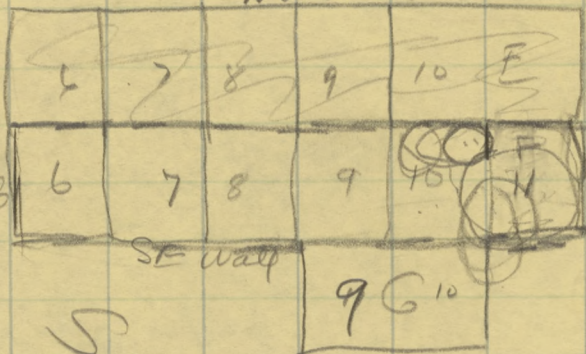
F 6925 12.4

dist
C 4642 11.7

W

NW wall

SW wall



N

NE wall

E

Initial cut

too soft 15" → mammal & bird in tar soaked sand (water/

to save

2-3' Tarsoaked sand occupying small space 3ft along SE wall
SE wall cutting thru it

birds, fox, coyote, deer, bear

4' Bear, coyote, badger skull - dep. V-shaped where S.E. wall cuts in
→ deposit funnel shaped & cut into
by SE wall

Passerines from Pit 10, nos. 3530-4300 (within these numbers)

✓¹³ Humerus

K3622-3624 ✓
 ✓ K3813, K3887
 K3988, 3990, 3994
 K4149, 4152
 K3982, 3984-3985

✓ Tarsometatarsus

K3532 ✓
 K3616-3618 ✓
 K3792-3794, 3799, 3797
 K3838, 3880
 ✓ K3977-3981
 KK4160

see all these numbers from 2 change

✓¹⁰ Carpometacarpus

K3614-3615
 K3815, 3820-3821
 K3972-3976

✓ Ulna

K3620-3621
 K3885-3886
 K3851
 K4142, K414(?)3 ?

✓²⁴ Tibiotarsus

K3535, 3547
 K3628
 K3825-3826, 3835-3836
 K3868, 3873
 K3905, K3983
 K3986-3987, K3989
 K3991-3993
 K4151, 4153-4159
 K4298

✓ Femur

K3638, K3533, K3860

Mandible -- K4302

Coracoid -- K4093

Scapula -- K4150

Numbers K3889, 3837 and 3610 I just gave you so you know the elements

Pica pit 10

G216 is of Pit 10 according to the catalogue. This is the number listed for Pica, I think, on your records. Our catalogue just says Pit 10, Humerus.

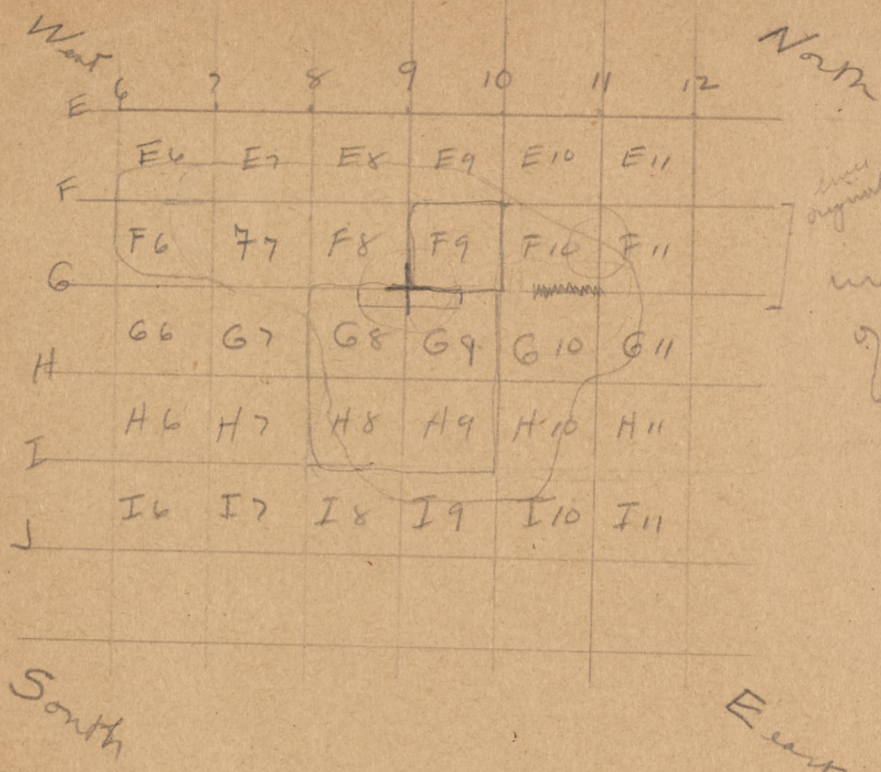
	A	B	C	D	E	F	G	H	I	J	→ etc.
1											
2	A ₁	B ₁	C ₁	D ₁	E ₁	F ₁					
3	A ₂	B ₂	C ₂	D ₂							
4	A ₃										
5	A ₄										
6	A ₅										
7	A ₆										
8	A ₇										

squares are 3 ft. sq.

over

Method of sectioning all pits according to introductory note to Pit 364W-man

over for probable section ship of Pit 10 as best I can deposit out from notes



+ = G9 which is indicated (see notes Feb 4) as crossing near center funnel surface.

E6, 7, 8, and 9 apparently were only tunneled into.

This is the picture which I reconstruct on the basis of the notes. See how it fits in with what you get out of it.

over

all
largely
extinct
as individuals

Chart showing number of ~~Extinct~~ individuals of ~~Extinct~~ species compared with number of Recent individuals (passerines & woodpeckers omitted)

11.10

Pit 10

31 Extinct
587 Recent

Pit 3

158 Extinct
346 Recent

Pit 4

425 Extinct
432 Recent

~~Continued Pit 10~~

use

Fig. 1

Chart showing comparison between individuals of species of large and of small raptors

Pit 10

63 Condors, Eagles
517 Hawks, Owls and Falcons

Pit 3

239 Large
134 Small

Pit 4

378 Large
85 Small

use

Fig. 2

NO. 700-20

CHARLES BRUNING COMPANY, INC.
20x20 to the inch.

How about
similar
chart on
passerines?

3573 (281)
8672433

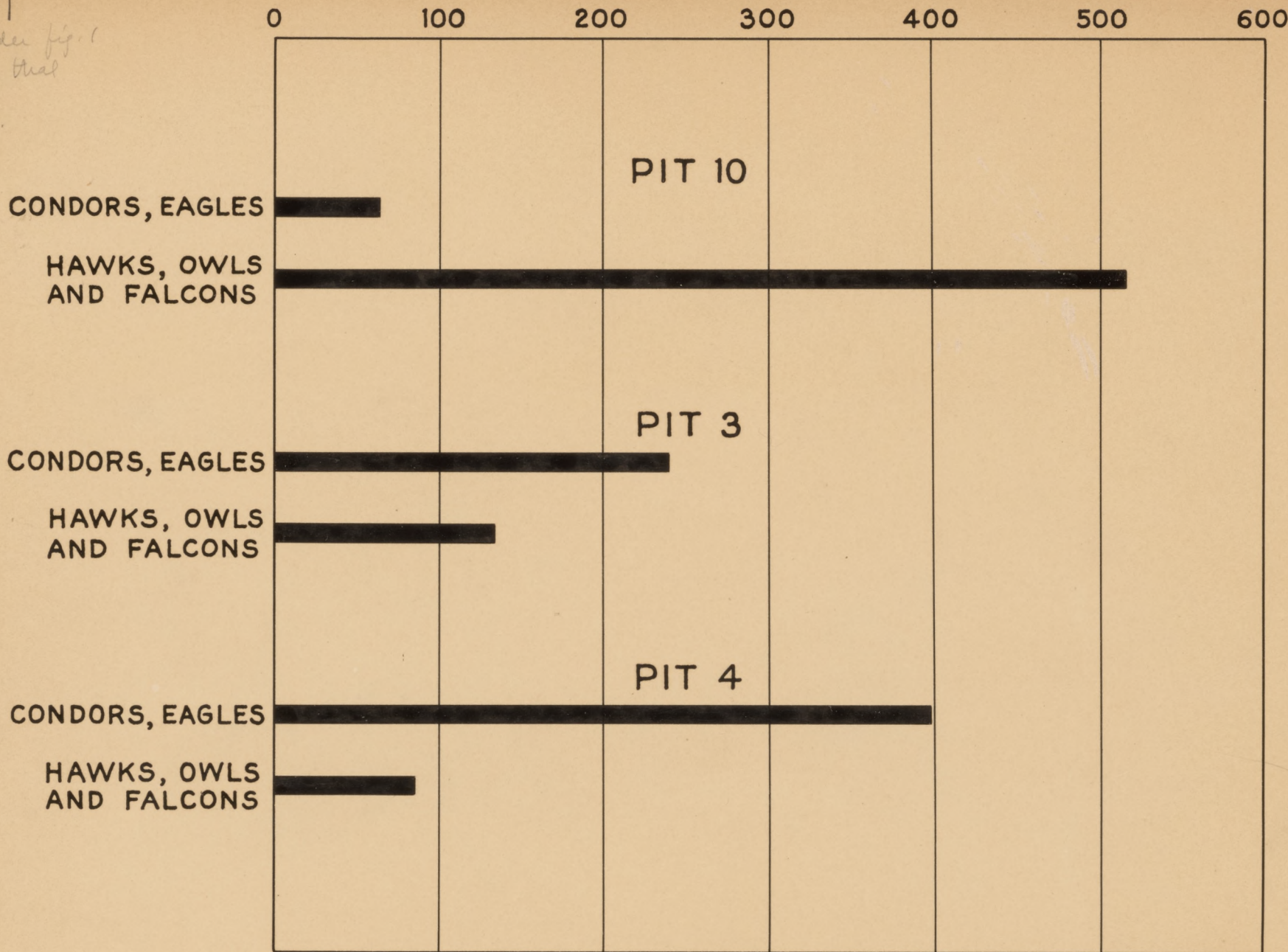
4187 (93)
5632281

PRINTED
U.S.A.

Fig. 2 1

Place under fig. 1
on page so that
numbered
lines agree.
allow space
between
for legend

3034



Howard Miller

4 in

Reduce to page width

3252
4

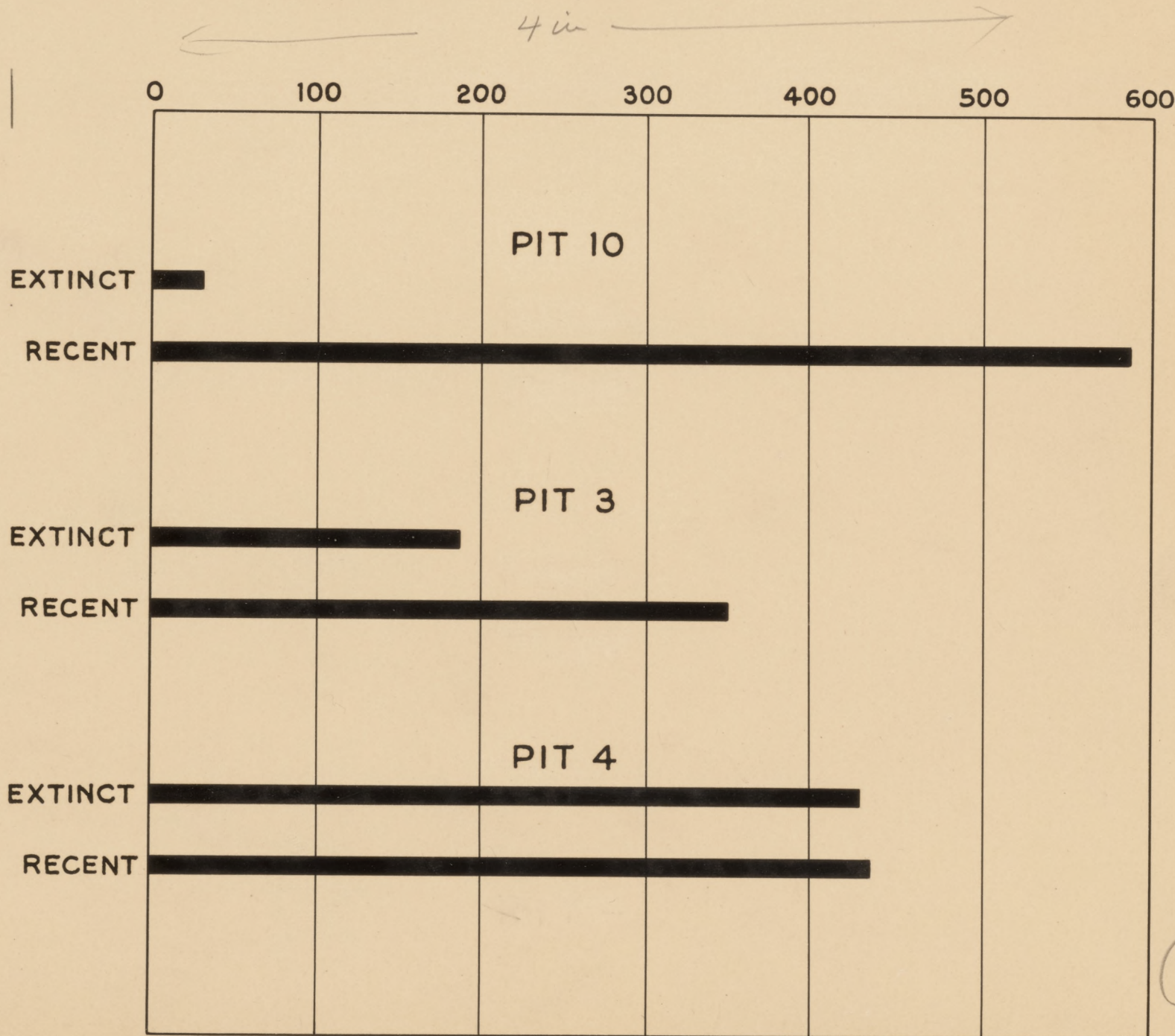
P00514

"Fig. 1

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on page so that
numbered lines
agree.
allow
space between
for legend

Reduce same as fig. 2

2534



Howard & Miller

514

3752